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AERONAUTICAL ENGINEERING

A Continuing Bibliography

Supplement 143

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in December 1981 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971. Since that time, monthly supplements have been issued.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 254 reports, journal articles, and other documents originally announced in December 1981 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

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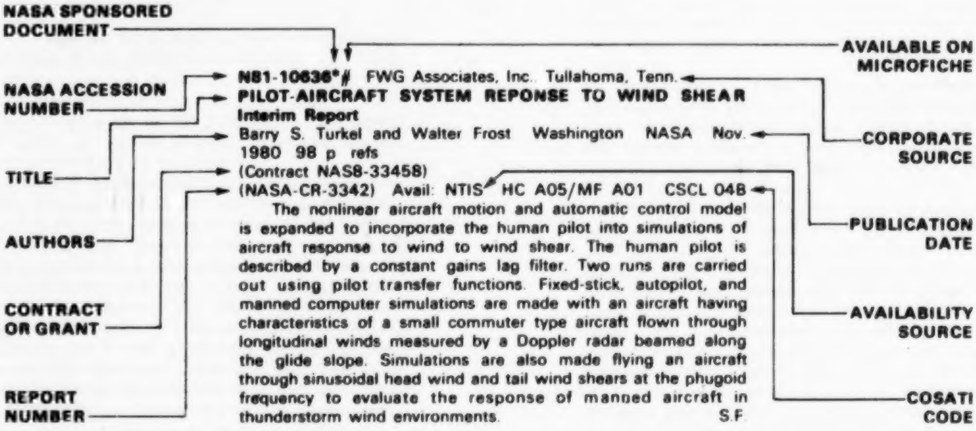
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N81-10636*# FWG Associates, Inc. Tullahoma, Tenn.
PILOT-AIRCRAFT SYSTEM REPONSE TO WIND SHEAR Interim Report
Barry S. Turkel and Walter Frost Washington NASA Nov. 1980 98 p refs
(Contract NAS8-33458)
(NASA-CR-3342) Avail: NTIS HC A05/MF A01 CSCL 04B

The nonlinear aircraft motion and automatic control model is expanded to incorporate the human pilot into simulations of aircraft response to wind to wind shear. The human pilot is described by a constant gains lag filter. Two runs are carried out using pilot transfer functions. Fixed-stick, autopilot, and manned computer simulations are made with an aircraft having characteristics of a small commuter type aircraft flown through longitudinal winds measured by a Doppler radar beamed along the glide slope. Simulations are also made flying an aircraft through sinusoidal head wind and tail wind shears at the phugoid frequency to evaluate the response of manned aircraft in thunderstorm wind environments. S.F.

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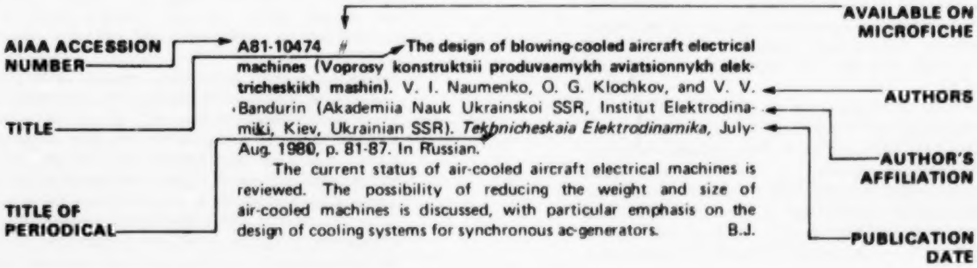
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A81-10474 # **The design of blowing-cooled aircraft electrical machines (Voprosy konstruktsii produvaemykh aviatsionnykh elektricheskikh mashin).** V. I. Naumenko, O. G. Klochkov, and V. V. Bandurin (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Tekhnicheskaia Elektrodinamika,* July-Aug. 1980, p. 81-87. In Russian.

The current status of air-cooled aircraft electrical machines is reviewed. The possibility of reducing the weight and size of air-cooled machines is discussed, with particular emphasis on the design of cooling systems for synchronous ac-generators. B.J.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 143)

JANUARY 1982

IAA ENTRIES

A81-47142 **Aircraft recognition by means of monostatic radar (Signature d'avions à l'aide du radar monostatique).** J.-Y. Mevel and G. Launay (Rennes I, Université, Rennes, France). *(Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etude sur la Reconnaissance des Formes et Signatures Radar, Paris, France, Jan. 30, 1980.) Annales des Télécommunications,* vol. 36, May-June 1981, p. 347-358. 16 refs. In French.

Consideration is given to the potential for aircraft recognition using a monostatic radar receiving echoes from the aircraft surface. The reconstruction of aircraft attitude with respect to a monostatic radar based on radar-derived trajectory data and wind data is examined and the parameters observable based on the radar echo are considered in relation to the possibility of shape recognition. It is shown that, although the geometrical reconstruction of aircraft shape by the classical monostatic tracking radar is probably impossible, signature identification may be possible through extended observation and comparison with a data bank. A signal analyzer used in an experimental study of aircraft identification by a tracking radar is then described and results of spectral analysis of measurements performed on a variety of propeller and jet aircraft are illustrated. A.L.W.

A81-47143 **An original method for the analysis of the power diffraction pattern of a radar target for shape recognition purposes (Méthode originale d'analyse du diagramme de diffraction en puissance d'une cible radar en vue de la reconnaissance des formes).** J. Saillard and G. Chassay (Rennes I, Université, Rennes, France). *(Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etude sur la Reconnaissance des Formes et Signatures Radar, Paris, France, Jan. 30, 1980.) Annales des Télécommunications,* vol. 36, May-June 1981, p. 359-368. In French.

The modeling of an airborne radar target is currently accomplished by the replacement of the object by a number of appropriately distributed bright points. The present paper considers the number of bright points necessary for the proper representation of a radar objective and the effective far-field radar cross section of a system modeled by an ensemble of bright points in relation to the problem of target shape recognition. It is shown that the effective cross section may be expressed as the sum of interference patterns of each possible set of two bright points. Consideration of the bipoint interference functions reveals that they can in turn be represented by a combination of Chebyshev polynomials of the first and second kinds, which can be reduced to an amplitude-moduled circular function and used to derive object dimensions by means of Fourier analysis. An example is presented of the analysis of a specific linear isotropic multipoint. A.L.W.

A81-47268 # **A formulation of the shimmy problem for swiveling wheels (Ob odnoi postanovke zadachi o shimmi orientiruiushchikhsia koles).** V. I. Goncharenko, L. G. Lobas, and N. V. Nikitina (Akademiia Nauk Ukrainskoi SSR, Institut Mekhaniki, Kiev, Ukrainian SSR). *Prikladnaia Mekhanika,* vol. 17, Aug. 1981, p. 82-88. 8 refs. In Russian.

Equations of motion are derived for a two-wheel landing gear strut with independently rotating wheels and an oblique alignment axis of the swivel on the basis of an improved version of the formulation proposed by Keldysh (1945). In the present approach, the complex parameter I used in the Keldysh formulation is ignored but, instead, an additional degree of freedom (in the lateral direction) is introduced. Although this results in higher dimensionality of the configuration space and higher order of the system of differential equations, the experimental determinations of the landing gear alignment become unambiguous. V.L.

A81-47425 * **Annual survey of spaceflight safety systems: 11th supplement. Survey period - July 1980-June 1981.** N. E. Brown and J. W. Brown (NASA, Johnson Space Center, Houston, TX). *International Astronautical Federation, International Astronautical Congress, 32nd, Rome, Italy, Sept. 6-12, 1981, Paper 81-251.* 22 p. 13 refs.

Reports in the field of space flight safety applicable to current and future operational space activities which appeared between July 1980 and June 1981 are surveyed. Subjects in the area of flight rescue and safety during launch, on-orbit, reentry and landing phases include the major activities and findings of the first Shuttle test flight, a slidewire system for emergency egress from the Space Shuttle on the launch pad, and the testing of the Spacelab engineering model. In the area of human capabilities and crew roles, attention is given to reports of repairs to the Salyut 6 space station made by a Soyuz crew, and an assessment of weightlessness effects on space worker health and safety. Safety requirements for STS payloads including pressure vessels, and the Orbiter window system and for spacecraft testing are also presented, along with those for a television system to aid in monitoring astronaut extravehicular activities. For the operation of large space structures, reports include EVA equipment for satellite servicing and the safety aspects of connectors used in construction. Finally, attention is given to safety-related criteria in a study of Shuttle interactions with the proposed Space Operations Center. A.L.W.

A81-47533 # **Errors of phase VLF-navigation systems under conditions of auroral disturbances (Ob oshibkakh sistem fazovoi SDV-navigatsii v usloviiakh avroral'nykh vozmushchenii).** M. I. Beloglazov. *Radiotekhnika,* vol. 36, July 1981, p. 32-34. 5 refs. In Russian.

Experimental data on the operation of VLF navigation systems at high latitudes under conditions of the quiet and disturbed auroral ionosphere are analyzed. It is shown that the mean-square errors of position determination at distances of 6000-7000 km at high latitudes are 5-6 times greater than at midlatitudes. At distances of about 1000 km, errors at high latitudes are twice as great as those at midlatitudes for quiet conditions and four times greater than those at midlatitudes for disturbed conditions. B.J.

A81-47551 # **Development of the carbon fiber-reinforced side rudder for the Airbus (Entwicklung eines kohlefaserverstärkten Seitenruders für den Airbus).** D. Schulz (Messerschmitt-Bölkow-Blohm GmbH, Hamburg, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-055.* 15 p. In German. Research supported by the Bundesministerium für Forschung und Technologie and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt. (MBB-UT-07-81)

Carbon-fiber-reinforced component parts have been developed to reduce aircraft weight, and thus render the aircraft more fuel efficient. The A310, designed for use by 1983, has spoilers, rudders, nose pieces, and fairings constructed of the carbon-fiber-reinforced material, which makes possible a 20% weight reduction over conventional components of light metals. Side rudders of the A300 and the A310 are compared, and goals such as an 18% weight reduction, acceptable maintenance costs, and similar manufacturing and safety standards are discussed. Construction limitations are considered, and material-specific problems are examined, including electrolytic corrosion, machinability, and the effects of humidity and temperature. Component tests are also conducted. It is found that the use of the carbon-reinforced component parts on aircraft as large as the A310 can lead to a 6000 kg weight reduction with a yearly savings of 45 million D.M. for a fleet of 30 aircraft. D.L.G.

A81-47552 **Active gust- and maneuver load control concepts, taking into account, as example, the Airbus A300. I - Design of a controller in the temporal domain for the alleviation of gust loads and the control of the effectiveness for stochastic gusts (Aktive Böen- und Manöverlastregelungs-Konzepte am Beispiel des Airbus A 300. I - Auslegung eines Reglers im Zeitbereich zur Böenlastminderung und Nachprüfung der Wirksamkeit für stochastische Böen).** J. Becker, O. Sensburg, and F. Weiss (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-065A.* 55 p. 12 refs. In German. (MBB-FE-172/S/PUB/39)

An active gust load control concept was designed for an Airbus configuration with 10% span extension. The design was made in the temporal domain on the basis of a quasi-steady representation of the aerodynamics for a rigid-elastic aircraft. Maximum values for wing load reduction were determined for a specific case, taking into account the control of external aileron, spoilers, and the elevator. An inspection of the effectiveness of the designed control concepts was performed in the frequency range for stochastic gusts. Attention is given to results of flutter calculations, the relation between alleviation of gust load and damping of flutter, and the bending moment characteristics. G.R.

A81-47553 **Active gust- and maneuver load reduction concepts, taking into account, as an example, the Airbus A300. II - Design of a controller for gust and maneuver load reduction in the frequency range (Aktive Böen- und Manöverlastminderungs-Konzepte am Beispiel des Airbus A300. II - Auslegung eines Reglers zur Böen- und Manöverlastminderung im Frequenzbereich).** G. Beuck (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-065B.* 27 p. 7 refs. In German. (MBB-UT-08-81)

A system which reduces surface loading due to vertical gusts and longitudinal maneuvers is considered. The employment of such a system in connection with an aircraft provides an approach for increasing the payload or the range of the aircraft. An investigation is conducted to explore the feasibility of using such an approach in the case of the A300 variant TA9. It is intended to retain the present wing structure of the A300B4 for the new design. Compared to the B4, the new aircraft is to have an extended wing tip and a greater payload. Currently existing A300 control surfaces are to be employed. The design of the controller for implementing the new system is discussed, taking into account an open and a closed loop system. The load reducing potential is determined along with the interior aileron, the three external spoilers, and the exterior aileron. G.R.

A81-47554 # **The calculation of transonic blade tip flow at helicopter rotors (Zur Berechnung der transsonischen Blattspitzenumströmung bei Hubschrauberrotoren).** H. Stahl and V. Mikulla (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-025.* 26 p. 11 refs. In German. (MBB-UD-320-81-OE)

Differences regarding the flow around the wing for fixed-wing and rotor-wing aircraft are discussed. A description is presented of results which were obtained with the aid of a rotor computational program based on the (two-dimensional) blade-element theory. The particular problem regarding the theoretical treatment of the flow around the blade tip is related to the characteristics of this flow, which is three-dimensional, unsteady, and becomes transonic on the advancing blade in the case of high forward speeds. Theories based on potential theory are discussed, although the assumptions of the theories are not satisfied at the rotating wing. Calculations using such procedures show, however, that the representation of the real flow relations at the blade tip is quite good. The procedures have the disadvantage of very long computation times. Attention is also given to a three-dimensional computational procedure of fixed-wing aerodynamics, which has been modified for a utilization in rotor calculations by introducing a Mach number gradient along the rotor radius. G.R.

A81-47555 # **The calculation of separated flow at helicopter bodies (Zur Berechnung der abgelösten Strömung an Hubschrauberrümpfen).** G. Polz (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-026.* 26 p. 17 refs. In German. (MBB-UD-321-81-OE)

In the case of helicopters, it is not always possible to avoid flow separation with wake formation at the rear of the fuselage. The wake region makes an analytical computation of the flow with the methods of the potential theory impossible. A survey of existing procedures for separated fuselage flows is provided, and a description is given of a computational model which is based on a combination of panel and boundary-layer computational procedures. The model makes use of a trailing body with uniform circulation distribution to simulate the wake region. The possibilities provided by the procedure are illustrated with the aid of pressure distribution and flowfield calculations. Results obtained in wind tunnel and flight tests are also shown. G.R.

A81-47556 **Design and construction of a model which is dynamically similar to the A310 wing (Auslegung und Bau eines dynamisch ähnlichen modells des A 310 Flügels).** H. Hönlinger (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-035.* 31 p. In German. (MBB-FE-17/S/PUB/42)

In investigations conducted to evaluate the flutter characteristics of a wing with supercritical profile, it is necessary to take, for the transonic domain, into consideration also the effect of the steady angle of attack. An experimental verification of this effect requires a wind tunnel study of flutter models with particularly accurate profile geometry. A description is presented of the design and the construction of a flutter model for the A310 wing with supercritical profile. The requirements for the design of the model, in scale of 1:20, including, in addition to a high profile accuracy, also a simple and cost-effective method of construction. In the selected design, the stiffness distribution in the model is simulated by means of a simple steel box. Profile geometry and model mass distribution are imitated with the aid of a foam structure, covered with a glass-fiber laminate. A finite-element model was used for the design of a complex propulsion unit suspension, which was idealized by means of profile beams. G.R.

A81-47557 **Surface-oriented coordinates for boundary-layer calculations in the case of general configurations (Oberflächenorientierte Koordinaten für Grenzschichtberechnungen an allgemeinen Konfigurationen).** E. H. Hirschel (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-014.* 26 p. 5 refs. In German. (MBB-FE-122/s/PUB/41)

The calculation of three-dimensional boundary layers requires the selection of a suitable coordinate system. A description is presented of an approach for obtaining surface-oriented, curvilinear, nonorthogonal, locally monoclinic coordinates for general wing and body configurations. It is shown that the boundary-layer coordinates for calculations of the first order present a special case of these coordinates. Metric tensor and curvature tensor of the surface are discussed, and relations are given for the transformation of Cartesian components of the frictionless external flow into boundary-layer coordinates. The employed tensorial concepts are used in the formulation of the boundary layer equations, and for the calculation of the streamlines of the frictionless external flow and boundary-wall streamlines. The application of the considered concepts is illustrated with the aid of specific examples of boundary-layer calculations involving aircraft wings and bodies. G.R.

A81-47562 # **Estimation of kinetic quantities of flight mechanics with a nonlinear observer (Schätzung flugmechanischer Bewegungsgrössen mit einem nichtlinearen Beobachter).** H. Seidel (Messerschmitt-Bölkow-Blohm GmbH, Hamburg, West Germany).

Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-067. 26 p. 18 refs. In German.

Investigations have been conducted regarding the employment of linear observers for a surveillance or a replacement of transducers. The considered study is concerned with an attempt to employ in the observer a nonlinear model in place of the linear one. The motivation for the study is related to the nonlinear characteristics of the mathematical models for the motions of flight mechanics. An adaptation of the model to the current flight conditions, which is necessary in the case of linear models, will not be needed if a nonlinear model is employed. The estimation of the variables of state for the longitudinal motion of the aircraft is discussed. The nonlinear differential equations which describe the symmetrical motion of an aircraft are considered, taking into account the state parameters airspeed, angle of attack, pitch (inclination), and pitch rate. Simulation results are presented, giving attention to steady and unsteady aerodynamic flight characteristics, and disturbances produced by gusts. A test shows that an estimate of the angle of attack with an accuracy of approximately 1 deg is possible. G.R.

A81-47563 # **European transonic wind tunnel ETW - Status of the project at the end of the predesign phase (Europäischer Transsonischer Windkanal ETW - Stand des Projektes am Ende der Vorentwurfsphase).** W. Schröder. *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-027.* 27 p. 24 refs. In German.

The predesign of the Basis ETW with a test cross-section area of 3.2 sq m and a maximum pressure of 4.5 bar was completed in spring 1980. The need for a European transonic wind tunnel for conducting tests at high Reynolds numbers is discussed, taking into account current wind-tunnel developments in Europe and the U.S. The specifications for the ETW are considered. The maximum Reynolds number for the ETW has been raised to a value of 50 million. This was done to enhance the cost effectiveness of testing in the ETW and to reduce development risks. The ETW will, therefore, provide for future European aircraft developments conditions for full-scale testing over a wide flight range. Attention is given to the performance spectrum of the ETW, an evaluation of the predesign, operational aspects of the ETW, the thermal inertia of the model, the pilot wind tunnel, the cryogenic technology program, and the future phases of the ETW program. G.R.

A81-47564 # **Measures for increasing the service life of riveted, aircraft-relevant joints (Massnahmen zur Lebensdauererhöhung flugzeugrelevanter Passnietfügungen).** L. Schwarmann (Vereinigte Flugtechnische Werke GmbH, Bremen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-052.* 16 p. 10 refs. In German.

Proof of the service life of structural components exposed to dynamic stresses is required in connection with the design of supporting structures for an aircraft. It has been found that the service life of such components is often determined by the ability of the riveted joints to withstand the operational stresses. The reported investigation is, therefore, concerned with approaches which make it possible to increase the service life of the riveted joints. Analytical and experimental investigations regarding the feasibility of two approaches for prolonging the service life of riveted joints are discussed, taking into account studies conducted with a test bar which is representative for aircraft-construction applications. One approach makes use of a press fit for rivet and hole. The second approach involves strain hardening of the rivet hole before driving the rivet. G.R.

A81-47565 # **Recognizing defects in carbon-fiber-reinforced plastics (Erkennbarkeit von Fehlern in CFK-Laminaten).** R. Schütze and W. Hillger (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Strukturmechanik, Braunschweig, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-057.* 20 p. In German.

The damage tolerance of structures made of carbon-fiber-reinforced plastic is tested under various loads. Test laminate (73/1/1, 24/9/1, 1465 A) specimens of thickness 1.5-3.2 mm with various defects were subjected to static and dynamic loads. Special attention was given to delamination, and ultrasonic C-scans were made on the specimens. It was shown that cracks from even small defects can be detected with great accuracy. The same probes were also X-rayed; defects that could not be detected under ordinary X-rays were bored and studied under vacuum by a contrast technique. The nondestructive ultrasonic and X-ray tests were controlled by partially destructive tests, and good agreement was observed between the two. J.F.

A81-47580 # **Employment of development simulation for the realization of direct side force control in the case of an attack aircraft (Einsatz der Entwicklungssimulation bei der Realisierung einer direkten Seitenkraftsteuerung an einem Kampfflugzeug).** U. Nortmann and H. J. Munser (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-063.* 50 p. 21 refs. In German.

Direct side force control (DSFC) has been realized in the case of the Alpha Jet. The program used for the implementation of DSFC is discussed, taking into account the program status before the flight test. Attention is given to the Alpha Jet fixed-seat simulator used as flight simulator, the first simulation investigations for DSFC, employment simulations involving the use of DSFC, development simulations for the determination of the required damping systems (DS), simulations for the determination of specification data for DSFC elements and onboard installations, and simulations with DSFC-DC hardware. The application range of simulation methods for the development of modern attack aircraft is examined. G.R.

A81-47585 # **Instrumentation for measurement of flow properties on a swept wing in flight.** A. Bertelrud (Flygtekniska Forsoksanstalten, Bromma, Sweden). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-034.* 31 p. 16 refs.

Flight tests are performed to measure flow properties on a swept wing to improve methods of extrapolating wind tunnel results, and to obtain data supporting the development of computational methods. The approach to the flight test is described with emphasis on the differences in results obtained during wind tunnel testing of fluid flow properties. Problems in flight testing of aerodynamic flow are considered, including flight conditions, unsteadiness, flexibility, heat flux, and nonrepeatability. Experiments using a swept-wing attack aircraft with a 35 deg sweep of the 25% chord line are conducted, indicating static pressure in the leading edge and wing tip regions. The data acquisition system on the laboratory aircraft is described with data from reference and aerodynamic probes. The system is found to allow correlations to be performed with the flight mechanical and structural aspects of the aircraft, and it is shown how the access to a large computer is essential in such testing. D.L.G.

A81-47587 # **The half-model technique in the wind tunnel and its employment in the development of the Airbus family (Die Halbmodelltechnik im Windkanal und ihre Anwendung bei der Entwicklung der Airbus-Familie).** H. P. Franz (Vereinigte Flugtechnische Werke GmbH, Bremen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-118.* 38 p. In German.

The half-model technique for conducting measurements in the wind tunnel is particularly suited for the development of large transport aircraft. The technique is especially useful in connection with the determination and the improvement of the aircraft characteristics related to takeoff and landing operations. Expenses for models are reduced and the obtainable Re-numbers are increased by the factor two. Drawback of the considered technique are also discussed, giving attention to the very exacting requirements for obtaining results having absolute accuracy, and the impossibility to study lateral motions. Details of applications of the half-model technique to Airbus family development projects are examined. G.R.

A81-47595 # **The influence of the airspeed on jet turbulence and the consequences for the jet noise (Einfluss der Fluggeschwindigkeit auf die Turbulenz im Triebwerksstrahl und seine Folgen für den Strahllärm).** U. Michel (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Experimentelle Strömungsmechanik, Berlin, West Germany). *Deutsche Gesellschaft für Luft-*

und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-021. 15 p. 10 refs. In German.

The turbulence in a free jet is the cause of jet noise and consequently a study of the effect of airspeed on jet noise must take into consideration the influence of the airspeed on the turbulence. A model for the description of free jet turbulence is discussed, taking into account investigations reported by Ffowcs Williams (1963) and Michalke (1979). According to Michalke, it is assumed that in a coordinate system at rest relative to the nozzle, there is an extension of the axial coherence distance. Michalke's assumption was utilized in the model which was developed to describe the effect of airspeed on free jet turbulence. The validity of the model could be experimentally confirmed on the basis of measurements of the cross-spectral density of the pressure fluctuations in the free jet. An indirect proof of its validity is provided by the agreement of the corresponding experimental values with the data calculated by means of a relation derived on the basis of the model. The agreement, which is very good, shows that there are no other noise sources in addition to the free jet. The absence of noise sources in the interior of the engine leaves no possibility to achieve a further reduction in aircraft-produced noise. G.R.

A81-47601 # **Investigations of vortex formation on wings with cropped leading edges (Untersuchungen über die Wirbelbildung an Flügeln mit geknickten Vorderkanten)**. U. Brennenstuhl and D. Hummel (Braunschweig, Technische Universität, Braunschweig, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-046*. 24 p. In German.

The aerodynamic characteristics of wings with cropped leading edges (double delta wings) are investigated. Measurements are made of the stress distribution and flow. Delta wings are found to produce flow with primary vortex accompanied by secondary separations of flow on each wing half. Streamlines are obtained with a marked secondary separation for wall streamlines on the suction side of the delta wing at an angle of incidence of 20 deg. Flow line development changes very little with inclinations of 20 deg, although a considerable change in flow develops at wing angles of 7.5 deg. At very large angles of incidence the two primary disturbances limit the maximum lift, and are found to originate from the wing tip and the cropping positions in the leading edges. Primary disturbances unite at growing angles of incidence, and produce changes in the stress distribution and aerodynamic parameters in the nonlinear incidence range. The investigation shows good correlation between calculations and measured results, which clarifies and quantifies the effects of turbulence on double delta wings. D.L.G.

A81-47603 # **Damage recognition and localization by means of differential modal analysis (Schadenerkennung und Schadenortung mittels differentieller Modalanalyse)**. O. Bschorr and J. Mittmann (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-056*. 11 p. 7 refs. In German.

The considered procedure for the recognition of defects is based on the measurement of the resonant frequencies and modes. Such measurements can be conducted for a new aircraft. A defect leading to a weakening in strength produces a displacement in the frequency. The theory of differential modal analysis is derived for the general case of an arbitrary structure, taking into account a partition of the investigated structure into finite elements. The vibrational behavior of this model can be described with the aid of the mass matrix and the stiffness matrix. A one-defect procedure is discussed. The accuracy of the localization procedure is investigated by studying four specimens involving aluminum rods of a length of 500 mm. The obtained results could be experimentally confirmed. G.R.

A81-47604 # **Contribution to the determination of the drag coefficient for air breathing flight vehicles on the basis of wind tunnel measurements (Beitrag zur Ermittlung des Widerstandsbeiwertes luftatmender Flugkoerper aus Windkanalmessungen)**. D. Deppe and W. Schamel (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-036*. 19 p. In German.

The considered procedure for the determination of the drag coefficient is illustrated with the aid of two specific flight vehicle projects, involving a typical subsonic flight vehicle with relatively large aspect ratio and a supersonic flight vehicle, using jet propulsion. The objective was in both cases, to provide a reliable prediction of the total drag value and, in addition, of the drag contributed by the individual flight vehicle components, taking into account body, wings, tail unit, and, in particular, the inlets. The principles of model drag evaluation are considered and an evaluation scheme is provided for each of the two flight vehicle projects. Evaluation results obtained for the supersonic flight vehicle are presented, taking into account a standard evaluation and alternative approaches. Attention is also given to the procedures which can be employed to derive the desired data for the flight vehicle itself on the basis of the results obtained with a small-scale model. G.R.

A81-47609 # **Application of reduced natural longitudinal stability in the Airbus program (Anwendung reduzierter natürlicher Längsstabilität im Airbusprogramm)**. U. Graeber and B. Fischer (Messerschmitt-Bölkow-Blohm GmbH, Hamburg, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-062*. 18 p. In German.

Advantages of the reduced longitudinal stability for an aircraft are related to drag reduction and performance improvements. The most significant advantage in the case of an airliner is a saving in fuel. The reported investigation shows that the realization of reduced natural longitudinal stability in the case of an aircraft of the type of the Airbus is possible by introducing a tail-unit trimming-tank system. The utilization of such a system makes it possible to affect the location of the center of gravity. The advantages and the limitations of this approach are discussed. The approach is suited for an optimal adaptation of the position of the center of gravity to the requirements of the phase of flight. G.R.

A81-47612 # **Onboard procedure for the measurement of wind shear gradients (Bordgebundenes Verfahren zur Messung von Scherwindgradienten)**. G. Neuwerth and R. Hartel (Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-060*. 18 p. 7 refs. In German.

The occurrence of wind shears constitutes a considerable risk for an aircraft, particularly during the takeoff and landing phases. The risk factors for the aircraft are connected with changes in lift and disturbances regarding the moments relations. A description is presented of a simple measurement procedure for the determination of the wind shear gradient. The considered onboard procedure can be employed for objectives of flight control and for meteorological measurements. The procedure is based on the measurement of the difference of dynamic pressures at two points of the aircraft. Two pitot tubes with a certain vertical distance from each other are connected by means of a flexible rubber tube. The described procedure was tested with the aid of an aircraft. The measured data showed good agreement with values obtained by means of a measurement device located on the ground. G.R.

A81-47616 # **A fail-operational duplex sensor concept for flight control systems on the basis of analytical redundancy (Ein fail-op Duplex-Sensorkonzept für Flugregelsysteme auf der Grundlage analytischer Redundanz)**. N. Stuckenberg (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugführung, Braunschweig, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-066*. 22 p. 7 refs. In German.

Based on a reliability concept of analytical redundancy, the fail-operational characteristics of a conventional triplex sensor configuration are determined by means of a duplex sensor configuration. Signals of instrument malfunction are generated by deterministic Luenberger observers. The operational efficiency of the reliability concept is determined as a function of the signal character of the instrument malfunction. As an example, the procedure is applied to the autopilot control system for the yawing motion of a HFB 320 commercial aircraft. The usefulness of this concept for a system of closed-loop design is shown to be questionable. Since no assumptions about the failure of the sensors or the signal character of an instrument malfunction can realistically be made, only those malfunctions which had a slight effect on the recognition algorithm and simultaneously a comparatively great effect on the controlled system could be given. The theory of optimal control shows that a deterministic optimal failure signal exists for every system configuration of every sensor. The performance of the concept is then determined by this signal pattern. J.F.

A81-47620 # **Ten years activity in the area of flight control for helicopters at night and in bad weather (Zehn Jahre Aktivität auf dem Gebiet der Flugführung von Hubschraubern bei Nacht und Schlechtwetter).** E. Kohnen (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugführung, Braunschweig, West Germany). *Deutsche Gesellschaft fur Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-064.* 24 p. 5 refs. In German.

Various flight control systems were studied, taking into account simulated and real flight conditions. The subjects investigated are related to aspects of pilot acceptance, obtainable flight control performance, the pilot work load, and the performance provided by various sensors. The employment of visibility aids for the pilot is considered. Systems supplying such aids can enlarge the range of helicopter employment by providing the pilot, in case of insufficient natural visibility, with the possibilities for a flight under quasi-visibility conditions. The effect of a utilization of the novel systems on flight control performance and pilot work load was studied. Attention was given to the design of features of instrument and sensor indication display which are favorable from the viewpoint of human engineering. G.R.

A81-47621 # **Computational fluid mechanics and its impact on the aircraft aerodynamicist.** B. Hunt (British Aerospace Public, Ltd., Co., Aircraft Group, Preston, Lancs., England). *Deutsche Gesellschaft fur Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-003.* 45 p.

The capabilities of modern computer-based theoretical methods for predicting the basic types of aerodynamic flow are examined. It is shown that although the methods of computational fluid mechanics can never totally supplant all of the more traditional designer tools, they can offer substantial improvements in the design process, in the quality of the final product, and in the development time and costs. It is also noted that if the capabilities of modern computers are to be realized in the form of user-oriented programs, then careful consideration must be given to the environment for which these programs are to be developed. V.L.

A81-47622 # **Vortex bursting on slender delta wings in transonic flow and its influence on missile aerodynamic characteristics.** J. M. Muylaert (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft fur Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-047.* 35 p. 29 refs. Research supported by the Bundesministerium der Verteidigung.

The influence of compressibility effects on vortex breakdown is investigated for the case of sharp-edged delta wings. Normal force and pitching moment measurements were made at Mach numbers of 0.60-0.85 for delta wing aspect ratios of 1.26, 1.6 and 2.0, with incidence angles varying between near-zero to well above the critical angle at which lee-side vortex breakdown was observed. Detailed study of the lee-side pressure distribution of a wing with an aspect ratio of 2.0 showed that, at the critical angle, the vortex bursting point suddenly jumps from behind the trailing edge to the 50% chord position, giving rise to loss of lift and nose down pitching moment. Schlieren photography and sublimation tests confirm these conclusions, which are visualized by means of water tunnel tests. Attention is given the effect of these phenomena on delta-winged missiles. O.C.

A81-47725 # **Prediction of range and endurance of jet aircraft at constant altitude.** C. W. Bert (Oklahoma, University, Norman, OK). *Journal of Aircraft,* vol. 18, Oct. 1981, p. 890-892. 15 refs.

Jonas (1947) has reported an analysis of range for turbojet-powered aircraft. Ashkenas (1948) has obtained an expression for a jet-aircraft range at altitudes below 35,000 ft and a logarithmic form for the constant-temperature stratosphere. In the current study, it is shown that neither the square-root expression derived by Jonas nor the logarithmic form are appropriate for constant-altitude cruise. The presented analysis removes two deficiencies in the earlier investigations and obtains a simple, closed-form expression which is more appropriate for constant-altitude cruise than either of the standard expressions of Jonas and Ashkenas. The closed-form equation is applied to an example problem. G.R.

A81-47785 **High peak energy shaped-pulse electromagnetic crack detection.** I. G. Hendrickson and K. A. Hansen (Boeing Co., Seattle, WA). In: Eddy-current characterization of materials and structures; Proceedings of the Symposium, Gaithersburg, MD, September 5-7, 1979. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 129-139.

A high peak energy, shaped-pulse, eddy current (SPEC) technique has been developed and investigated with the objective of improving crack detection of thick multiple-layer aircraft structures. The SPEC concept is reviewed, and it involves applying the high current level slow rise time or low-frequency portion of the shaped pulse to obtain the required depth-of-field penetration into the structure. The basic SPEC instrument is described: It is comprised of (1) a pulsar unit to produce the shaped current pulse, (2) a transmit or drive coil to generate the electromagnetic field to be injected into and collapsed out of the structure to be tested, and (3) a receive or pickup coil to detect the produced eddy currents/magnetic fields collapsing from within the structure and modified by cracks in the structure. Investigations include tests of variables, including base-metal conductivity, fastener variability, edge margin, interface gap, fastener height/countersink depth, upper-layer thickness, and probe lift-off. It is shown that crack-inspection capabilities of second-layer structures with 0.635 to 1.27-cm-thick upper layer skin have been improved significantly with the SPEC inspection system. K.S.

A81-47801 **Test methods and design allowables for fibrous composites; Proceedings of the Symposium, Dearborn, MI, October 2, 3, 1979.** Symposium sponsored by the American Society for Testing and Materials. Edited by C. C. Chamis (NASA, Lewis Research Center, Cleveland, OH). Philadelphia, PA, American Society for Testing and Materials (ASTM Special Technical Publication, No. 734), 1981. 442 p. $44.

Papers are presented on special test methods for fibrous composites for quantifying design material properties. Studies are divided into four major areas: (1) new and special test methods, including those for transverse tensile strength, shear modulus, longitudinal compression, and impact resistance; (2) special test methods and analysis, including off-axes and angle-plied tension and compression, fracture and fatigue, and biaxial stress states; (3) design allowables, describing procedures for setting and selecting design allowables in general, and also for composite aircraft structures, graphite/polyimide bolted joints, cost-effective mechanical property characterization, statistical considerations, intraply hybrids, and compression and fatigue; (4) design allowables for special applications, describing procedures for buckling of cylindrical components, proof load of pressure vessels, strength of composite joints, and environmental effects and creep. The papers provide considerable information for test methods and for composite analysis of these methods, as well as tests and procedures for establishing design allowables. K.S.

A81-47811 **Developing design allowables for composite helicopter structures.** M. J. Rich and D. P. Maass (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: Test methods and design allowables for fibrous composites; Proceedings of the Symposium, Dearborn, MI, October 2, 3, 1979. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 181-194. 13 refs.

A procedure is presented for developing static and fatigue design allowables for advanced composite materials used in aircraft structures. The allowables are established at the material lamina level accounting for environmental conditions such as moisture and elevated temperatures. Kevlar/epoxy and graphite/epoxy specimens are tested, and static and fatigue strength and the elastic constants are obtained for basic laminate orientations of a woven fabric and a unidirectional tape. Static test results are presented as a percentage of mean room temperature dry strength. It is shown that the environmental effects are more pronounced for the matrix modes than for the fiber modes of the fracture, and that Kevlar/epoxy is more sensitive to the environmental design conditions than graphite/epoxy. A constant-life diagram, representing fatigue test results as a percentage of room temperature wet static tensile strength, shows that the tension-compression and compression-compression range may be the major aspect of fatigue design. It is also shown that the use of small sample sizes using a simple normal distribution seems to be sufficiently accurate to establish static design allowables. K.S.

A81-47813 **Cost-effective mechanical property characterization.** J. A. Suarez (Grumman Aerospace Corp., Structural Mechanics Section, Bethpage, NY). In: Test methods and design allowables for fibrous composites; Proceedings of the Symposium, Dearborn, MI, October 2, 3, 1979. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 208-228. Contract No. F33615-78-C-5234.

Current cost-effective mechanical property characterization methods are described for advanced composites in automotive and stiffness-critical aircraft secondary structures, using coupon-type specimens tailored to the special application at hand. The automotive application involves the testing of a roof spider and gullwing doors of a brushed stainless steel and reinforced-plastic sports car, while the aerospace application involves the establishment of material and process specifications, selection of a long-term moisture-absorption criterion, and coupon static tests to establish design values with environmental and vacuum-pressure-cure knockdown factors. Data presented include those for test tensile strength and modulus for vacuum-pressure cured graphite/epoxy laminates of various fiber orientations. The design values, given as ratios of dry strength at temperature of autoclave-cured laminates, are established and used in the design of a trailing-edge component. Among the conclusions presented are that abbreviated coupon testing for static design values for secondary structures can be applied to expand utilization of composite structures and rapid processing of composites for high production rates or minimum manufacturing costs can result in a reduction of compression strength. K.S.

A81-47842 **Hyperbolic origins.** C. Powell. *Journal of Navigation,* vol. 34, Sept. 1981, p. 424-436. 26 refs.

An historical account is given of antecedents of modern radio position-fixing systems whose position lines are of hyperbolic form. Consideration is given (1) synchronized sound signals, by which simultaneous transmissions from different points made possible the derivation of a position line by the differential timing of signal reception; (2) sound ranging, in which the position of enemy guns was determined through a comparison of the times at which its report reached a number of listening posts; (3) radio-acoustic trials, in which the acoustic element consisted of sea-bottom hydrophones near shore; (4) comparison of radio signal strength, by which a chain of transmitting stations would enable receiving ships to find their position; (5) ranging and position fixing, where two pairs of receiving stations in a crossed-baseline layout fixed the position of a transmitter-carrying ship; (6) Doppler-effect radio systems; (7) hyperbolic position-fixing for mobile receivers; (8) free-running transmissions; (9) frequency-modulation, for the resolution of hyperbolic pattern ambiguity; and finally (10) the GEE, LORAN and QM systems. O.C.

A81-47843 **The relation between aircraft fuel reserves and navigation.** V. W. Attwooll (Civil Aviation Authority, London, England). *(Royal Institute of Navigation, Meeting, London, England, Jan. 21, 1981.) Journal of Navigation,* vol. 34, Sept. 1981, p. 437-449; Discussion, p. 450, 451.

A rational basis is presented for the determination of fuel uplift quantities in commercial operations, in relation to safety and regularity of services. Numerical models are devised as aids in estimating such factors as the regularity of service to be expected from a given fuel quantity uplifted at take-off, assuming that in-flight decisions about fuel usage are made in a rigid, automatic way. Navigation figures as an important element because all in-flight decisions demand exact knowledge of aircraft position. Attention is given the possible effects on fuel uplift policies of various changes and developments in aircraft equipment and air traffic control (ATC) systems; for instance: (1) the use of blind landing equipment of high reliability can influence a pilot's decision to continue holding or divert to an alternative landing site; and (2) airborne flight management systems are being developed to help the pilot implement fuel conservation through automatic estimates of the best speed and altitude to fly under given conditions, reducing fuel consumption by an estimated 1.6%. O.C.

A81-47844 **A simple radar for navigation accuracy measurements.** S. Nagaoka, E. Yoshioka, and P. T. Muto. *Journal of Navigation,* vol. 34, Sept. 1981, p. 462-469. 6 refs.

In order to survey height-keeping errors, a simple, height-finding radar, or Navigation Accuracy Measurement System (NAMS), has been developed. The radar, which is based on a curve-fitting method, consists of an antenna with fan-beam radiation pattern, a transceiver, a digitizer and a mini-computer; with the antenna rotating about a horizontal axis and scanning aircraft flying overhead. The height of detected aircraft is estimated by processing the data obtained over several scans. The height-measurement accuracy of NAMS depends upon the method of signal processing, the number of radar plots (depending on flight conditions), and the accuracy of input data. Results of a computer simulation of the system for the case of turbojet aircraft flying at altitudes of 30-40,000 feet are presented, in terms of lateral deviation in nm and estimated height measurement error. O.C.

A81-47888 **A practical probabilistic method for evaluating the fail-safeness of structures that may fail due to fatigue.** J. R. Gebman (Rand Corp., Engineering and Applied Sciences Dept., Santa Monica, CA) and P. C. Paris (Washington University, St. Louis, MO). In: Fatigue crack growth measurement and data analysis; Proceedings of the Symposium, Pittsburgh, PA, October 29, 30, 1979. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 271-280. 9 refs.

The undetected propagation of a fatigue crack constitutes a significant cause of aircraft and other structural failures. To raise the structural failure load to a relatively high level, the manufacturer can divide the structure into many small elements, which significantly increases the ability of a structure to tolerate an element failure. This paper presents a procedure for calculating the probability that the structure has not failed, as the function of the crack propagation history for an undetected fatigue crack. The form of the procedure is so simple that computations with a desk calculator can yield reasonably accurate results. Moreover, the necessary input data are often readily available. By adopting such a procedure, aircraft manufacturers and operators can better identify those elements that pose the greatest threat to structural integrity. (Author)

A81-47957 # **Damping of turbomachine blade variations by subsonic flow.** G. S. Pisarenko, A. A. Kaminer, V. A. Balalaev, N. Ia. Nastenko, A. L. Stel'makh, and A. V. Dunaev. In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 151-161.

Experimental results are presented concerning aerodynamic damping for compressor blades in nonuniform subsonic flow with vortex wakes. The effects of stator and rotor spacing, maximum additional velocity in the wake, the orientation of the wake in relation to the profile chord, the regime parameters of the flow, and the geometrical parameters of the cascade were investigated. Results show that the nonuniformity of the flow which occurs in turbomachines has no influence on the aerodynamic damping. B.J.

A81-47959 # **Stability and flutter analysis of turbine blades at low speed.** T. J. Akai and H. Atassi (Notre Dame, University, Notre Dame, IN). In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 187-201. 9 refs. Contract No. F49620-76-C-0014.

An aeroelastic analysis for highly loaded turbine blades at low speed is carried out for various vibratory modes. These include pure bending and torsion as well as coupled oscillatory modes. The analysis is based on a complete aerodynamic theory which fully accounts for the blade geometry, flow conditions and cascade parameters. A damping coefficient simulating structural damping is also included. The results clearly show that classical flutter can occur for low speed turbine cascades at typical operating conditions. This is directly attributable to high blade loading and thickness. (Author)

A81-47961 # **Numerical experiments on unsteady flows through vibrating cascades.** M. Pandolfi. In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 211-228. 8 refs.

A numerical approach is presented for computing the inviscid compressible 2D unsteady flow in a vibrating cascade. The full Euler Equations are considered and no restrictive assumptions are required about geometry of the blading. The analysis is here confined to subsonic flows. The description of the modeling of the boundaries and the numerical methodology is given. Particular attention is paid to the explicit treatment of the wake behind the blade during the unsteady flow. Checks on the accuracy of the computations are done and comments are given on few numerical examples. (Author)

A81-47962 # **Computer-aided investigation of turbomachine aerodynamics and aeroelasticity.** S. M. Belotserkovskii, A. S. Vol'mir, V. V. Kuleshov, M. I. Nisht, G. U. Stepanov, and R. M. Fedorov. In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 229-249. 31 refs.

The paper examines aspects of the computer-aided solution of aeroelasticity problems in turbomachines by the synthesis of numerical methods of unsteady aerodynamics and elasticity. In particular, it is shown that in solving nonlinear aeroelasticity problems it is necessary to perform the step integration of nonlinear equations of aerodynamics and aeroelasticity. Aerodynamic loads and deformations for each step can be corrected by an iteration method. B.J.

A81-47963 # **On the numerical analysis of stall flutter in turbine cascade.** S. Takahara (Mitsubishi Heavy Industries, Ltd., Nagasaki, Japan), T. Adachi, and Y. Kadoya. In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 251-262. 7 refs.

The modified FLIC method using the triangular finite element mesh pattern was employed to solve the problem of unsteady stalled flow through a turbine cascade; the calculation was performed for the vibration of grouped blades without taking into account the interblade phase angle of vibration. Numerical results for low-pressure end blades of a steam turbine were compared with flutter test data on aerodynamic damping, and satisfactory agreement was obtained. It is concluded that this method is suitable for the prediction of the stall flutter characteristics of blade profiles. B.J.

A81-47966 # **Stability analysis of the twin mode model of coupled flexion-torsion vibrations in aeroengine fans.** R. A. J. Ford (New South Wales, University, Kensington, Australia). In: Aeroelasticity in turbomachines; Proceedings of the Second International Symposium, Lausanne, Switzerland, September 8-12, 1980. Zurich, Juris-Verlag, 1981, p. 297-308.

The twin mode representation of coupled flexion-torsion vibrations in aeroengine fans is essentially a linear feedback system in which flutter is represented by system instability. In earlier papers the model was analysed from direct physical considerations; in this paper the analysis is extended, amplified and unified by applying classical automatic control theory to the twin mode model. The results generally confirm the basic conclusions of the earlier analysis although they have also identified and clarified a number of detail misconceptions which had arisen in the previous work. (Author)

A81-47993 **Damping applications for vibration control; Proceedings of the Winter Annual Meeting, Chicago, IL, November 16-21, 1980.** Meeting sponsored by the American Society of Mechanical Engineers. Edited by P. J. Torvik (USAF, Institute of Technology, Wright-Patterson AFB, OH). New York, American Society of Mechanical Engineers (Applied Mechanics Symposia Series. AMD Volume 38), 1980. 163 p. $24.

Papers are presented on viscoelastic materials for damping applications, friction damping, damping applications in aeropropulsion systems, and the treatment of damping in transient computations. Attention is also given to the damping capacity of fiber reinforced composites, to the damping of panels due to ambient air, and to the application of damping for noise control in diesel engine components. C.R.

A81-47999 # **Damping applications in aero-propulsion systems.** J. P. Henderson (USAF, Materials Laboratory, Wright-Patterson AFB, OH). In: Damping applications for vibration control; Proceedings of the Winter Annual Meeting, Chicago, IL, November 16-21, 1980. New York, American Society of Mechanical Engineers, 1980, p. 145-158. 21 refs. AF Project 2418.

Several applications of vibration damping technology to high cycle fatigue problems in jet engine components are discussed. It is shown that constrained layer damping treatments, using polymeric materials, have provided cost effective solutions to many difficult high maintenance cost situations. On the other hand, engine experience with vitreous enamel coatings for the damping of hot engine components, although very promising, has pointed the need for further material development for increased durability. (Author)

A81-48003 **Digital simulation for energy conservation in a large wind tunnel plant system.** F. L. Shope (ARO, Inc., Arnold Engineering Development Center, Arnold Air Force Station, TN). In: Annual Simulation Symposium, 13th, Tampa, FL, March 19-21, 1980, Record of Proceedings. Tampa, FL, Annual Simulation Symposium, 1980, p. 73-86. 12 refs.

This paper documents a feasibility study of mathematically modeling the wind tunnel complex and associated plant in the von Karman Gas Dynamics Facility at the Air Force's Arnold Engineering Development Center in Tennessee. The ultimate goal of the modeling effort is to effect energy conservation measures by modifying operational procedures and plant hardware. A general theory is proposed to model the aerodynamics and losses of each plant or tunnel component in terms of a set of 33 equations based on one-dimensional, unsteady, nonisentropic flow and admitting arbitrary interconnections between components. A computer program is currently under development to apply the theoretical model using the IBM Continuous System Modeling Program III. In conjunction with the modeling effort, an assessment was made of the existing experimental data base which could be used to drive the mathematical model. Requirements for experimental data are discussed in general terms. (Author)

A81-48009 **Simulation model to evaluate maintenance strategies for large network of fielded systems.** G. A. Wong (Mitre Corp., McLean, VA). In: Annual Simulation Symposium, 13th, Tampa, FL, March 19-21, 1980, Record of Proceedings. Tampa, FL, Annual Simulation Symposium, 1980, p. 311-326. U.S. Department of Transportation Contract No. FA80WA-4370.

A dynamic simulation model of a field maintenance organization has been developed and validated. The objective of the model is to provide an analytical tool for evaluating the operational feasibility of new maintenance strategies prior to their introduction into the field. This simulation model is an accurate replica of the policies and time critical maintenance activities within a field organization, providing a rendering in detail of each technician and each facility as events take place in time. This paper discusses the structure of the model, the functions simulated, the validation experiment, and an application of the model. (Author)

A81-48062 # **New developments in compact plate-fin heat exchangers.** K. O. Parker and M. G. Coombs (AiResearch Manufacturing Company of California, Torrance, CA). In: Compact heat exchangers - History, technological advancement and mechanical design problems; Proceedings of the Twenty-fourth Annual International Gas Turbine Conference and First Solar Energy Conference, San Diego, CA, March 11-15, 1979. Conferences sponsored by the American Society of Mechanical Engineers. New York, American Society of Mechanical Engineers (Heat Transfer Symposia Series. HTD Volume 10), 1980, p. 171-179.

The extension of compact plate-fin heat exchanger capabilities in order to accommodate the performance requirements of regeneratively cooled hypersonic ramjet engines, laser weapons, aircraft engine infrared suppressors, and large high-efficiency gas turbine cycles is described. Attention is given to cooling fluid flow path geometry and heat exchanger fabrication techniques, such novel materials as alumina and silicon carbide, and space and weight constraints imposed on designs by airborne application. It is shown that operating temperatures, pressures and area densities have been significantly increased. O.C.

A81-48064 **Fly-by-wire Jaguar.** G. Warwick. *Flight International,* vol. 120, Sept. 12, 1981, p. 816-818.

A status report is given for the fly-by-wire Jaguar fighter test bed, which is equipped with a full-time, quadruplex digital flight control system offering a theoretical mean time between catastrophic failures of 250 million hours. General consideration is given the advantages of fly-by-wire and electronic flight control systems (such as relaxed stability and stability simulation, respectively), and parallel developments for the Mirage 2000 and MBB F-104 and Advanced Fighter Technology Integration F-16 research aircraft are cited. Attention is given to the digital management of pilot maneuver demand inputs by the flight computer, the integration of sensor signals, fail-safe reliability of all system elements, pre-flight testing of input tolerances, and software development. Future avenues for design development of such systems and their application to advanced fighters are also discussed. O.C.

A81-48067 **F-100s set to become target drones.** D. M. North. *Aviation Week and Space Technology,* vol. 115, Sept. 28, 1981, p. 69-71.

The Military Aircraft Storage and Disposition Center has undertaken the conversion of about 300 stored F-100s into QF-100 target drones. An account is given of the techniques by which retired military aircraft are conditioned for storage, so that hydraulic, fuel, electrical and electronic systems may be rapidly brought to operating condition and all structures are protected from fatigue and corrosion. It is noted that the facility's location at Tucson, AZ, affords it the low rainfall, 10-20% humidity, and alkaline soil needed to minimize deterioration. Other aircraft in storage, such as A-4s that have been sold to Malaysia for active manned service, are also stored for eventual refurbishment by private companies. Other aircraft similarly processed have been F-102s, A-7s and F-8s. O.C.

A81-48079 **Droplet breakup regimes and criteria for their existence.** A. A. Borisov, B. E. Gel'fand, M. S. Natanzon, and O. M. Kossov (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR). *(Inzhenerno-Fizicheskii Zhurnal,* vol. 40, Jan. 1981, p. 64-70.) *Journal of Engineering Physics,* vol. 40, no. 1, July 1981, p 44-49. 31 refs. Translation.

Experimental and theoretical work on droplet breakup by a gas flow in shock tubes and nozzles is reviewed. By analyzing experimental results, three droplet breakup regimes are identified: (1) droplet breakup of the parachute type, (2) droplet breakup with tearing off of the surface layer, and (3) explosive breakup of droplets. Conditions for the favored development of one or the other droplet breakup regimes are briefly discussed. V.L.

A81-48097 # **Calculation of natural vibrations for thin-walled irregular reinforced shells of the helicopter fuselage type using the finite-element work method (Raschet na sobstvennye kolebaniia tonkostennykh nereguliarnykh podkreplennykh obolochek tipa fiuzeliazha vertoleta konechno-elementnym metodom sil).** F. F. Baiazitov and Z. I. Burman. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Tverdogo Tela,* July-Aug. 1981, p. 149-159. 12 refs. In Russian.

An equation describing the natural vibrations of a fuselage is obtained in terms of the work method using a three-dimensional Green's function, and a transformation leading to an equation based on the method of displacements is given. A method is proposed for reducing the order of the dynamic matrix. It is shown that the natural frequencies obtained using a reduced-order matrix are in good agreement with frequencies obtained with a higher-order dynamic matrix. V.L.

A81-48120 **The role of the earth's shape in navigation - An example.** W. Kuebler and S. Sommers (Hydrotronics, Inc., McLean, VA). *Navigation,* vol. 28, Spring 1981, p. 29-33. 7 refs.

The accuracy of navigational fixes obtainable with present day navigation systems is such that the earth's geodesy must be considered, especially in comparing relative fixes. Approximations to the exact transformations between geodetic and geocentric coordinates can be made so as to optimize computer times. This paper presents the results of a systematic error analysis of these approximations to the exact coordinate transformations and the resulting real-time and core requirements on an AN/UYK-20 standard Navy mini-computer. (Author)

A81-48121 **An analytical solution of the two star sight problem of celestial navigation.** J. A. Van Allen. *Navigation,* vol. 28, Spring 1981, p. 40-43. Navy-supported research.

The classical problem of celestial navigation, in its simplest form, is the determination of an observer's longitude and latitude from the altitudes of two identified stars, observed at a known Greenwich Mean Time on a known date. A novel solution of this problem in closed analytical form is given herein. The solution yields the two possible positions of the observer without any prior knowledge of his position, without any dependence on tables of computed altitudes and azimuths for an assumed position, and without any graphical work. The basic two-fold ambiguity is resolved to yield a single, unique position by repeating the calculation using the altitudes of a third star and of one of the two previous stars. The full analytical solution is given as are some artificial numerical examples, readily performed on a hand-held, programmable calculator. (Author)

A81-48142 **Sliding-seal electron beam slot welding of an aircraft wing closure beam.** R. W. Messler, Jr. (Eutectic Corp., Flushing, NY). *Welding Journal,* vol. 60, Sept. 1981, p. 31-39.

A technique was developed for eliminating the seal wear associated with sliding-seal electron beam (EB) welding. This method, referred to as slot welding, involves the use of a cover plate that seals statically to the sliding seal welding head; the cover plate is sealed with an O-ring to a slotted chamber cover plate. By welding through the hole-and-slot arrangement between the sealing plate and a small movable vacuum chamber, the inherent advantages of EB welding can be combined with the rapid pump-down, low capital equipment cost, and the portability of the technique. Five tapered channel Ti-6Al-6V-2Sn wing closure beams for the F-14A were sliding-seal EB welded to demonstrate the system. The first four beams were welded using a partial penetration locking pass, followed by a full penetration locking pass at 30 kV/50 mA, 6.20 A, and 30 ipm; the fifth beam was welded without the partial penetration locking pass. The resulting welds were all uniform and fairly clean, but porosity was reduced in the fifth beam by elimination of the locking pass. The tensile, fracture toughness, and fatigue properties of the welded specimens were compared to those of the base metal and showed good results. J.F.

A81-48196 # **Analysis of the operation of air turborefrigeration plants and their use for on-the-ground air-conditioning of aircraft (Analiz rabochego protsessa vozdushnykh turbokholodil'nykh ustanovok /VTKhU/ i ikh primenenie dlia nazemnogo konditsionirovaniia vozdukha na samoletakh).** E. Pasztor (Budapesti Muszaki Egyetem, Budapest, Hungary). *Periodica Polytechnica, Transportation Engineering,* vol. 9, no. 1, 1981, p. 37-47. 7 refs. In Russian.

The theory and operation of turborefrigeration plants which use air as refrigerant are examined. Consideration is given to the effects of losses in the various turborefrigerator components on the specific cooling power. It is shown that there exists an optimum value of the specific cooling power which depends on the pressure ratio. Applications of turborefrigerators are discussed with particular reference to on-the-ground air-conditioning of aircraft. V.L.

A81-48328 **The array processor - A real-time simulator.** M. E. Sturgeon (Floating Point Systems, Inc., Beaverton, OR). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 12-14.

The technique of parallel processing with an array processor is described; overviews are presented of architecture, functional components, software, and simulation applications (sea state simulation, aircraft simulation, and road simulation). The architecture features parallelism and pipelining in both the hardware and software. The floating-point arithmetic hardware provides fast high-precision calculations. The input/output interfaces provide access to the outside world via a variety of peripheral devices. A general-purpose computer with a host with a parallel processor offers an attractive alternative to the large mainframe or wholly analog system. B.J.

A81-48329 **Function generation techniques.** H. R. Justice (Computer Sciences Corp., Defense Systems Div., Huntsville, AL). In: Summer Computer Simulation Conference, Seattle, WA, August

25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 15, 16.

Available methods of function generation in real-time hybrid simulations are reviewed. A particular technique that was used on a real-time hybrid simulation of a Simplified Inertial Guidance-Demonstration (SIG-D) in the Advanced Simulation Center at Redstone, Alabama is presented in detail. It is shown that the Multi-Variable Function Generator (MVFG) developed by Electronic Associates provides an attractive alternative to the other available methods of function generation in a hybrid simulation. Because of the large bandwidth of the MVFG, multiplexing techniques can be used to expand the number of functions obtainable from the available MVFG units. The multiplexing scheme presented herein provides a reliable method of expanding the function generation capacity in any hybrid facility that contains function generators with similar characteristics to the MVFG. B.J.

A81-48333 **A technique for the implementation of nonlinear models as real-time digital simulations.** P. McLaughlin (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 111-115. 12 refs.

This paper presents a technique that can be utilized to perform real-time simulation tasks using digital computers. For certain types of nonlinear models, the computational stability of simulations employing this technique will be more attractive than that obtained from alternative approaches. This, in turn, allows the use of more complex models or, conversely, less expensive computers in these tasks. The technique is based on an implicit method used at the Pratt and Whitney Aircraft Group to simulate the steady-state and transient operation of turbine engines and their components. The manner in which the technique is implemented for a general nonlinear model is described. The stability and accuracy of the technique is compared to other methods used for real-time simulation. A discussion of modifications appropriate to programs employing integer arithmetic is included. (Author)

A81-48351 **Numerical simulation of hydrodynamic ram.** K. D. Kimsey (U.S. Army, Ballistics Research Laboratory, Aberdeen Proving Ground, MD). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 299-301. 8 refs.

The paper presents the results of a numerical simulation of a kinetic energy projectile with an L/D ratio of 3 impacting at normal obliquity a fuel cell simulator. The simulation has been performed using the two-dimensional EPIC-2 (Elastic-Plastic Impact Computation in 2 Dimensions) code. The technique is based on a Lagrangian formulation where the equations of motion are integrated directly, rather than through the traditional stiffness matrix approach. The analysis has confirmed that the entrance panel petaling results from the fluid impulsively accelerating the entrance panel. The hydrostatic pressures generated in the fluid initiate bulging of the exit panel prior to perforation by the penetrator. V.L.

A81-48358 **The evolution of real-time digital simulation of aircraft for training applications.** G. V. Amico and C. E. Lindahl (U.S. Navy, Naval Training Equipment Center, Orlando, FL). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 365-370. 15 refs.

The evolution of real-time digital simulation for flight trainers is reviewed with emphasis on computer system architecture, iteration rates, and programming. With respect to computer architecture, the trend has been one of going from expensive CPU's to the present system architecture of inexpensive and powerful distributed processors based on a functional allocation to the subsystems involved in the flight trainers. Iteration rates are expected to be influenced by on-board computers whose iteration rates may exceed the current 30 Hz standard. Progress is also expected in the use of FORTRAN as more efficient compilers are developed by computer manufacturers for real-time simulation. V.L.

A81-48359 **Probe protection in camera/model visual systems.** P. J. Bellocchio and R. B. Mallinson (Singer Co., Link Flight Simulation Div., Binghamton, NY). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 371-374. Contract No. N61339-76-C-0086.

A system has been developed for protecting the optical probe from collision with the modelboard during low altitude flight simulation in helicopter training simulators. The system uses a solid state infrared laser as a probe height sensor and an auxiliary impact sensor for additional protection around the probe tip. The probe protection software makes use of the probe height sensor output to make a decision as to whether a crash is imminent, and if necessary, issues a command for an emergency retraction of the probe. V.L.

A81-48368 **Simulation of Microwave Landing System.** J. K. Hsiao (U.S. Navy, Naval Research Laboratory, Washington, DC). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 542-546.

The FAA Microwave Landing System (MLS) uses a Time Reference Scanning Beam configuration. The ground installation uses two linear electronically scanned antenna arrays, scanning in azimuth and elevation directions. Radiating signals from the arrays in the 'TO' and 'FRO' directions received by a landing aircraft can be used to determine accurately the aircraft's angular position in both azimuth and elevation. The accuracy of the angle measurement depends on the beam steering algorithm, array component tolerances, multipath effects, failures in the array, and other associated problems. A computer simulation has been developed which represents the performance of the various phased array antenna systems which are being considered for use in the Microwave Landing System. The purpose of this simulation is to assess the angular accuracy of MLS in terms of its design parameters, tolerance effects, component and subsystem failures, multipath, and angle detection algorithm. The entire angle-measurement process used in MLS is modeled, including the phased array antenna, the beam steering algorithm, multipath propagation, and the airborne receiver and angle processor. (Author)

A81-48369 * **Time delays in flight simulator visual displays.** D. F. Crane (NASA, Ames Research Center, Moffett Field, CA). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 552-557. 13 refs.

It is pointed out that the effects of delays of less than 100 msec in visual displays on pilot dynamic response and system performance are of particular interest at this time because improvements in the latest computer-generated imagery (CGI) systems are expected to reduce CGI displays delays to this range. Attention is given to data which quantify the effects of display delays in the range of 0-100 msec on system stability and performance, and pilot dynamic response for a particular choice of aircraft dynamics, display, controller, and task. The conventional control system design methods are reviewed, the pilot response data presented, and data for long delays, all suggest lead filter compensation of display delay. Pilot-aircraft system crossover frequency information guides compensation filter specification. G.R.

A81-48371 **Application of optimal control and estimation to autopilot and autothrottle systems.** P. D. Daniels and D. Gangsaas (Boeing Commercial Airplane Co., Seattle, WA). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 562-565.

Methods for improving autopilot and autothrottle designs are discussed. Particular attention is given to reducing speed and path deviations and control surface activity in the presence of gust wind shear disturbances during the climb, cruise, and descent phases of flight. Linear quadratic regulator synthesis is used for the design of optimal full state feedback controllers. Kalman filters are designed for optimal estimation of airplane and wind states, and computer simulations are used for evaluation of various control designs. V.L.

A81-48373 **Optimization of simulation models for avionics software verification.** S. L. Benning (USAF, Avionics Laboratory, Wright-Patterson AFB, OH) and A. C. Brewer (Systems Consultants, Inc., Dayton, OH). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 570-573. 5 refs. Contract No. F33615-79-C-1739.

Various optimization techniques applied to maintain a cost-effective simulation system are investigated for the reorganization of the DAIS models simulation system. Present model requirements are discussed, and methods of optimizing are presented, including system analysis, priority matrix, SET/USE program, standard comment header, COMMON standard, structured FORTRAN, and word processing. Three phases of testing are used to verify the enhanced performance of the models, including stand-alone testing, integration and functional testing, and system testing. Any anomalies are detected, corrected, and verified to confirm proper operation. Results demonstrate an exceptionally effective methodology with widespread applications, producing faster and better structured models which are more readily maintained and transported. D.L.G.

A81-48376 **Development considerations for real-time aircraft/avionic distributed computer control systems.** R. D. Hawkins (U.S. Naval Air Systems Command, Washington, DC). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 586-589.

Concepts in real-time aircraft/avionic distributed computer control systems are investigated in an effort to produce a superior avionic product. NATO's efforts to establish an architecture oriented avionics technology are discussed, and the objectives of the Tactical Air Combat Technology Integration and Coordination System (TACTICS) are presented, including a continuity in the design process as a result of close interaction between all major elements of the computer system. The objectives of the systems software simulation laboratory and the real-time simulation laboratory are also presented, including the synthesis and formulation of tactical air combat avionics suites and the physical validation of actual hardware. Needs of the TACTICS facility such as the development of structured methodology to perform the synthesis functions are explained, and the solution is found in the structured design approach which requires the partitioning of the system functions into isolated modules. D.L.G.

A81-48379 **Engine requirements for the T-37 trainer aircraft - A simulation study and analysis.** T. D. Clark, Jr., L. W. Emmelhainz, and M. A. Martinez (USAF, Institute of Technology, Wright-Patterson AFB, OH). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 660-662.

The Air Force requires an operational inventory of aircraft engines to maintain the flow of T-37 aircraft used in basic pilot-training programs. This paper reports the results of a study of the system for acquiring and managing engines and components to support the flying training program. A network model was constructed and tested, and a number of experiments conducted to address key issues and problems in the system. The model is programmed using the Q-GERT simulation language. It focuses on the engine service required to support given levels of flying activity. Inventory levels at distributed points in the system are investigated and policies for placement recommended. The structure of the repair system is focused upon and various alternatives for its design are investigated. (Author)

A81-48380 **Determination of cargo container inventories through logistics simulation.** D. H. Cone (Boeing Computer Services Co., Seattle, WA). In: Summer Computer Simulation Conference, Seattle, WA, August 25-27, 1980, Proceedings. Arlington, VA, AFIPS Press, 1980, p. 714-718.

A Container Movement Logistics Model was designed to evaluate the air shipment of cargo containers within a network of airport pairs. The simulation described in the paper was designed to determine the number of cargo containers required for a known level of air shipments, but the technique may be applied to surface transportation modes including rail, truck, and ship. (Author)

A81-48385 **Transient vibrations of elastic panels due to the impact of shock waves.** J. R. Coleby and J. Mazumdar (Adelaide, University, Adelaide, Australia). *Journal of Sound and Vibration,* vol. 77, Aug. 22, 1981, p. 481-494. 14 refs.

The dynamic response of elastic panels subjected to pressure loadings by shock waves is investigated. Accurate approximate solutions for the time-history response (displacement and strain) of both a completely clamped panel and a simply supported panel are obtained. The transient behavior is discussed by using the isoamplitude contour lines method in conjunction with the normal mode method. The derived analyses are shown to be applicable in estimations of window, wall panel, or flat roof response to sonic boom or explosion blast waves. Illustrative examples are given for the response of an undamped skew panel and for an undamped triangular panel. Results, given in graphic form, are in good agreement with those obtained in previous investigations. J.F.

A81-48390 **Finite strip analysis of singly curved skin-stringer structures.** M. Petyt and C. C. Fleischer (Southampton, University, Southampton, England). *Journal of Sound and Vibration,* vol. 77, Aug. 22, 1981, p. 561-571. 17 refs. Research supported by the Ministry of Defence (Procurement Executive).

It is shown that the finite strip method can accurately predict the natural frequencies and modes of vibration of singly curved, skin-stringer arrays. The elements analyzed included a rectangular, singly curved, finite strip shell element and a new, compatible thin walled, open section beam element. Convergence studies for freely supported and clamped singly curved, rectangular shells show that only a few strips need to be used to obtain good accuracy. Both five bay and 15 bay skin-stringer structures were analyzed; the five bay structure analysis produced results similar to those of the transfer matrix method; the frequencies and mode shapes obtained in an analysis of the 15 bay structure also agreed closely with experimental measurements. J.F.

A81-48395 * **Trailing edge noise prediction from measured surface pressures.** T. F. Brooks (NASA, Langley Research Center, Hampton, VA) and T. H. Hodgson (North Carolina State University, Raleigh, NC). *Journal of Sound and Vibration,* vol. 78, Sept. 8, 1981, p. 69-117. 35 refs. Grant No. NsG-1377.

Trailing edge (TE) noise is investigated for the case of a two-dimensional airfoil embedded in a uniform low Mach number flow, and the usefulness of several TE noise theories is examined by applying them to the measured data. The TE noise spectra and directivity are quantitatively determined for the case of a high Reynolds number and a fully turbulent boundary layer. Parameters include angle of attack, flow velocity and TE bluntness. Evanescent wave theories by Chase (1975) and Chandiramani (1974) are compared to the present results and show good agreement. Agreement of the near field pressure scatter phenomenon analysis with measurements implies that the basic assumptions used in the analysis are correct, i.e., the turbulent boundary layer (TBL) flow passes the trailing edge into the wake region. No hydrodynamic wake shedding activity is confirmed for the two-sided TBL flow, and a method incorporating the principles of the coherent output power method is used to determine the sound field. The near field edge scatter model is found to not only establish optimum sizing of edge treatment for noise control, but also to separate and identify the scattered field from the incident hydrodynamic field. D.L.G.

A81-48401 # **Operational characteristics comparison /ACV and SES/.** F. W. Wilson and P. R. Viars (U.S. Naval Material Command, David W. Taylor Naval Ship Research and Development Center, Bethesda, MD). *American Institute of Aeronautics and Astronautics, Marine Systems Conference, 6th, Seattle, WA, Sept. 14-16, 1981, Paper 81-2064.* 12 p. 8 refs.

The performance of a fully skirted air cushion vehicle (ACV) relative to a sidehull air cushion vehicle or to a surface effect ship is evaluated by comparing the estimated total drag and power of the two vehicle types. The craft are compared on the basis of equivalent displacement, length-to-beam (L/B) ratio, loading, and speed. Drag estimation techniques, developed under the Amphibious Assault Landing Craft project for the ACV predictions and under the Surface Effect Ship project for the SES predictions, are used in the evaluation. The parameter ranges covered in the study were speed (30 to 70 knots), displacement (100 to 10,000 long tons), and loading (1.0 and 3.0 lb/ft). Results indicate that each craft type has distinct operational ranges where it has a powering advantage over the other craft. (Author)

A81-48416 # **A new approach to weapon separation aerodynamics.** F. A. Tessitore, A. Cenko, R. C. Meyer (Grumman

Aerospace Corp., Bethpage, NY), R. D. Dyer, and J. D. Waskiewicz (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Conference, Dayton, OH, Aug. 11-13, 1981, Paper 81-1654.* 8 p. 8 refs.

An innovative approach has been developed for predicting the aerodynamic forces and moments acting on a store during separation from a parent aircraft. The method utilizes data obtained for one store in the flowfield to predict the forces and moments of another store in the same flowfield by identifying the local angle-of-attack distribution in proximity to the parent aircraft. Extensive comparisons between theory and test are shown for two different parent models, each with two different stores (four stores in all) at supersonic speeds, indicating the excellent correlation achieved. The potential for substantial wind tunnel cost savings is identified. (Author)

A81-48417 # **Determination of thrust and throttle-dependent drag for fighter aircraft.** B. L. Hunt and N. S. Gowadia (Northrop Corp., Aircraft Div., Hawthorne, CA). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Conference, Dayton, OH, Aug. 11-13, 1981, Paper 81-1692.* 15 p. 13 refs.

This paper reviews the problem of determining the thrust and throttle-dependent drag of fighter aircraft. The flight conditions for which throttle-dependent drag is important are identified. Means of determining throttle-dependent drag are discussed with particular emphasis on wind tunnel techniques and the incorporation of the results into the overall drag build-up of the aircraft. Procedures are described for determining thrust and drag from flight test data. Finally, the impact of advanced concepts, such as thrust vectoring, thrust reversing and highly integrated concepts, on propulsion testing is discussed. (Author)

A81-48479 **Measured pressure distributions and shock shapes on a simple delta wing.** L. C. Squire (Cambridge University, Cambridge, England). *Aeronautical Quarterly,* vol. 32, Aug. 1981, p. 188-198.

This note presents the results of an experimental investigation of the flow over a simple delta wing designed for a Mach number of 3.5. Complete pressure distributions were measured for incidences of 0 deg, 10 deg and 20 deg at Mach numbers of 2.5 and 3.5. A number of schlieren photographs of the shock system around the wing were obtained at the same conditions, and surface streamline patterns were studied at M = 3.5. The measurements were made to support numerical calculations which use this wing as a test case. (Author)

A81-48480 **Evaluation of two-dimensional subsonic oscillatory airforce coefficients and loading distributions.** D. J. Salmond (Royal Aircraft Establishment, Farnborough, Hants., England). *Aeronautical Quarterly,* vol. 32, Aug. 1981, p. 199-211. 9 refs.

A method is described for calculating numerically the aerodynamic stiffness and damping coefficients and loading distributions for a two-dimensional thin aerofoil oscillating harmonically in subsonic flow, from the Possio Integral Equation by approximating the loading by a finite series of basis functions. Sample loading distributions obtained by using the method are presented for a Mach number of 0.9 and a frequency parameter of 0.4. (Author)

A81-48544 **Adaptive features and measurement requirements for advanced surveillance radars.** B. H. Browne, Jr., L. Ekchian, and L. J. Lawdermilt (Sperry Corp., Clearwater, FL). In: EASCON '80; Electronics and Aerospace Systems Conference, Arlington, VA, September 29-October 1, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, 1980, p. 190-194. 10 refs. Contract No. F30602-79-C-0152.

The measurement accuracy requirements for several classes of tactical air control problems are discussed, and adaptive approaches to beam scheduling and tracking are presented that exploit the agile beam capabilities of the radar to jointly meet both search and track requirements over a wide range of tactical situations. It is found that adaptive features are required in future agile-beam surveillance radars, including adaptive beam scheduling, adaptive waveform selection, adaptive tracking filters, and tracking filter selection. It is noted that in future agile-beam surveillance radars it will be expedient to employ algorithms that adaptively select tracking filters matched to the assessed tracking difficulty and available processing power. C.R.

A81-48547 **COMLINK - A communications/EW analytical and modeling tool.** R. K. Keenan (Keenan Corp., Vienna, VA). In: EASCON '80; Electronics and Aerospace Systems Conference, Arlington, VA, September 29-October 1, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, 1980, p. 244-252. 10 refs.

COMLINK is defined as a user-interactive microcomputer-based system designed to provide an objective basis for rapid and accurate analyses and modeling of communications scenarios involving three-dimensional dynamic tactical and strategic geometries, with or without jammer. The analytical approach to the conditions of no spectrum spreading, frequency hopping, direct spread spectrum, and hybrid Blue modes (the modulation being QPSK or BPSK or FSK or SQPSK) and follower or barrage or no jammer are discussed. Numerical results are given for an example tactical problem (16 kbit QPSK voice, follower jammer). The purpose is to record the insights of a certain group of engineers on how to deal with the 'dB bookkeeping' problem when the computational tedium index is stressed in the analysis of modern spread-spectrum communications systems. C.R.

A81-48558 # **Availability requirements of the future ATC system.** A. G. Zellweger (FAA, Washington, DC). In: EASCON '80; Electronics and Aerospace Systems Conference, Arlington, VA, September 29-October 1, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, 1980, p. 400-405.

The functional evolution of ATC computer availability requirements is reported with emphasis on fault tolerance and system backup to establish the evolving requirements for availability. ATC is characterized in terms of a closed loop theory model consisting of functional elements such as a data managing function and a system function which executes control actions and is subject to disturbances such as weather and equipment outages. The ATC system of the 1980's and beyond the 1990's is discussed, and improvements are proposed, including increasing the number of control processes automatically performed, and entering new and revised data at all operational positions. Present and future fault tolerance requirements are also discussed, and improvements in error detection and isolation are suggested, which require greater software correctness through proofs of critical modules. Safety is the overriding concern, and a quantitative increase in confidence in system safety is sought. D.L.G.

A81-48559 * **Reliability validation of systems for life-critical applications.** K. S. Trivedi (Duke University, Durham, NC), J. W. Gault (North Carolina State University, Raleigh, NC), and J. B. Clary (Research Triangle Institute, Research Triangle Park, NC). In: EASCON '80; Electronics and Aerospace Systems Conference, Arlington, VA, September 29-October 1, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, 1980, p. 406-409. 7 refs. Contract No. NAS1-15833.

A framework is proposed which addresses traditional reliability validation approaches consisting of life testing techniques which are inapplicable for digital flight control systems. A specific validation methodology is identified based on logical proofs, analytical modeling, and experimental testing. Research activities required to support continued development of validation technology are identified, and the validation procedure is driven by the reliability model obtained from the system description. The analytical reliability model is shown to be a proper abstraction of the system under consideration, and a proof of correctness of system design and system scheduler performance is proposed. D.L.G.

A81-48566 **Infrared airborne radar.** R. C. Harney (MIT, Lexington, MA). In: EASCON '80; Electronics and Aerospace Systems Conference, Arlington, VA, September 29-October 1, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, 1980, p. 462-471. 12 refs. USAF-sponsored research.

A program aimed at developing and demonstrating the technology necessary for the construction of infrared radars for tactical airborne applications is briefly reviewed. Infrared radar and conventional radar are compared, the comparison showing that infrared radar is a direct extension of the conventional radar principles to infrared wavelengths. A testbed radar system for measuring imaging properties, weather penetration, and moving target indication is described, and it is stated that tactical airborne applications will require radar systems much more powerful and complex than the testbed radar. A transportable measurements radar, scaled up to parameter values useful in tactical scenarios, and examples of its initial performance are presented. Component technology unique to infrared radars is emphasized, and component developments pertinent to the transportable system are discussed. K.S.

A81-48602 # **Ray-theory predictions of the sound radiated from realistic engine intakes.** A. J. Kempton and M. G. Smith (Rolls-Royce, Ltd., Derby, England). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1982.* 8 p. 6 refs.

Ray theory is used to calculate the propagation, attenuation, and radiation of broadband fan-noise for realistic engine-intake configurations. The theory is compared with the mode theory for an infinite hyperboloidal duct, showing excellent agreement at the given frequencies, except close to the duct wall; this discrepancy is due to the neglect of diffraction in the ray theory approach outside the shadow region in calculating the radiation of high-frequency sound from a smooth engine intake. Bellmouth intakes had a large effect on the directivity of both the radiated sound and the insertion loss. The sound-pressure-level (SPL) insertion loss at one angle in the far field was more dependent on the source type for ducts fitted with bellmouth intakes than for flanged cylindrical ducts. The effect on the radiated sound of complex intake flows was of the order of the flow Mach number if the flow was rotational, but only of the order of the Mach number squared if the flow was irrotational. A new method of choosing intake liners to optimize the EPNL reduction is described; this method is based on the theory that the SPL insertion loss at typical fan-noise frequencies is largely independent of the source frequency, and depends principally on the liner impedance, liner length, and engine geometry. J.F.

A81-48606 # **An acoustic source modelling technique to predict the near sound field of axisymmetric turbulent jets.** C. V. Sundaram and J. R. Maus (Tennessee, University, Tullahoma, TN). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2022.* 10 p. 9 refs. Contract No. F40600-77-C-0009.

According to the considered technique, the source for each one third octave frequency is modelled by a combination of uncorrelated elementary sources derived from a multipole expansion. The strengths of the various source components at a particular frequency are determined by a constrained least squares fit to the far field directivity pattern. When the effects of the source motion and axial source distribution with frequency are taken into account, the computed sound field agrees reasonably well with data obtained in the near field. Computations at higher frequencies (roughly, above 1000 Hz) indicated that the dependence of the predicted near sound pressure levels on the order of terms considered from multipole expansion series decreases as the frequency under consideration increases. G.R.

A81-48607 * # **The role of the helical jet mode in aerodynamic noise generation.** J. C. Hardin (NASA, Langley Research Center, Acoustics and Noise Reduction Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1963.* 10 p. 38 refs.

The helical jet mode is modeled by an infinite helical vortex filament, and an exact analytical solution for the induced velocity field interior to the filament is derived. These expressions are then used to model the jet flow field and to analyze the high subsonic and supersonic jet noise generation. It is shown that noise will be generated directly if the helical mode convects or rotates. Reducing this noise by stabilizing the mode is difficult, since the self-induced velocities of the mode itself cause it to convect and rotate; the use of noncircular nozzles is suggested to eliminate the symmetry of the boundary condition. The helical mode can also generate noise indirectly by inducing time-dependent Coriolis accelerations on small-scale turbulence propagating in its induced velocity field. This suggests that any upstream turbulence generation has an enhanced potential for noise propagation when propagating in the presence of the helical mode. J.F.

A81-48608 # **Procedure for evaluation of engine isolators for reduced structure-borne interior noise transmission.** J. F. Unruh (Southwest Research Institute, San Antonio, TX). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1970.* 12 p. 10 refs.

A structure-borne interior noise transmission model of a test aircraft was developed, based on analytical models of the simulated engine, vibration isolators, and engine mount structure coupled to an empirical model of the fuselage. Interior sound pressure level transfer function data for isolators with varying mechanical properties were analyzed and compared to predicted transmission levels. The elastomeric isolators did not operate as constant property single degree-of-freedom systems with respect to noise isolation: noise isolation beyond approximately 150 Hz leveled off and decreased somewhat above 600 Hz. The frequency dependence of the isolator material properties was found to play an important role in the transmission of structure-borne noise in the mid- to high-frequency region of the spectrum; isolator stiffness was a strong parameter, while isolator damping was a much weaker parameter. Moderate changes to the lightweight high-strength engine mount structure did not affect the transmission phenomena. J.F.

A81-48610 # **Prediction of flyover jet noise spectra.** U. Michel (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung Turbulenzforschung, Berlin, West Germany) and A. Michalke (Berlin, Technische Universität, Berlin, West Germany). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2025.* 9 p. 17 refs.

A scaling law is derived for predicting the flyover noise spectra of a single stream shock free circular jet from static experiments. The law is valid for unheated and heated jets, the theory being based on an experimentally supported similarity law for the influence of the flight velocity on the turbulent flow field of a jet. The resulting scaling laws for the difference between third octave spectra and the overall sound pressure are found to compare very well with flyover experiments with a jet engine and wind tunnel experiments with a heated model jet. C.R.

A81-48612 * # **Theoretical and experimental evaluation of transmission loss of cylinders.** Y. S. Wang, M. J. Crocker (Purdue University, West Lafayette, IN), and P. K. Raju. *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1971.* 10 p. 13 refs. NASA-supported research.

A technique is reported which evaluates the transmission loss of a cylinder from measurements of the incident and transmitted intensities. Incident intensity is calculated from the space-averaged measured pressure and the assumption that the source space is reverberant. Transmitted intensity is measured by means of the microphone acoustic intensity technique using a fast Fourier transform analyzer. The first dip at the ring frequency, and the other at the critical coincidence frequency are predicted in the transmission loss curve of a cylindrical shell with a 0.762 m diameter and a 1.67 m length. Results are compared and demonstrate good agreement for frequencies above 500 Hz. It is concluded that the technique combining the measurement of both intensities gives accurate results and is simpler and less expensive than the conventional method. D.L.G.

A81-48613 * # **Experiments on the nonlinear characteristics of noise propagation from low and moderate Reynolds number supersonic jets.** J. A. Gallagher and D. K. McLaughlin (Oklahoma State University, Stillwater, OK). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2041.* 9 p. 10 refs. Grant No. NAG1-10.

A series of experiments were conducted on high-speed model jets to identify and quantify the distortion of radiated noise by nonlinear propagation effects. The jets were operated in a low to moderate Reynolds number range, and the radiated noise was either broadband or discrete in frequency. Three condenser microphones were used to measure the waveforms propagated by the axisymmetric, cold model jets of Mach numbers 2.1 and 2.5. Relatively low Reynolds numbers were obtained by exhausting the jets into a low pressure anechoic test chamber. Nonlinear propagation distortion effects, such as wave steepening, harmonic generation and wave merging, were easily quantified. At a moderate Reynolds number, low frequency production and wave amalgamation, measured by a decrease in the zero crossings per unit time, were quantified in the propagation of sound away from the jet. J.F.

A81-48615 * # **Tip geometry effects on the model helicopter rotor low frequency broadband noise.** N. G. Humbad and W. L. Harris (MIT, Cambridge, MA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2003.* 14 p. 19 refs. Grant No. NsG-1583.

The effect of rotor blade tip shapes and performance parameters on the low frequency broadband noise (LFBN) is investigated experimentally. The experimental results show 2 to 5 dB reductions for swept geometries compared with square tip blades at constant blade loading. A theoretical model is formulated which includes a detailed lift response function. For the square tip blades, theoretical results are found to be in good agreement with the experimental results. While the effects of advance ratio and tip speed on the LFBN are explicable, those of blade loading are not clearly understood. C.R.

A81-48618 * # **Laboratory study of efficient add-on treatments for interior noise control in light aircraft.** J. S. Mixson, L. A. Roussos, C. K. Barton (NASA, Langley Research Center, Hampton, VA), R. Vaicaitist (Columbia University, New York, NY), and M. Slazak. *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1969.* 12 p. 15 refs.

Experimental and theoretical studies of the transmission loss (TL) of 1.15 x 1.46 m flat stiffened-skin aluminum panels are described. Panel configurations included panels with no treatment and eight combinations of treatments consisting of a fiberglass-septum layer, a foam-foil damping material, and a plywood double wall trim panel. Measured TL of the untreated panel and the panel with a damping layer showed characteristics of the double mass law: at low frequencies the TL followed a mass law trend associated with the average mass of both skin and stiffness, while at higher frequencies the TL followed a mass law trend associated with skin mass only. A comparison of TL for panels treated with a damping layer, a fiberglass layer, or a trim panel showed that the effects of damping are frequency dependent with some performing better below 500 Hz and others performing better above 500 Hz. Treatment combinations showed that two treatments with the same mass could have TL values different by about 10 dB, while other combinations having weights different by a factor of two could have TL values within a few dB over most of the frequency range. The highest TL values (50 dB at 1000 Hz) were obtained with a treatment consisting of a fiberglass layer, a trim panel, and damping layers on both the stiffened panel and the trim panel. J.F.

A81-48620 # **Engine noise source breakdown - Theory, simulation and results.** B. J. Tester (Rolls-Royce, Ltd., Derby, England) and M. J. Fisher (Southampton, University, Southampton, England). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2040.* 11 p.

Cross-spectrum measurements in the far-field of an aero-engine are processed to form a source image along the engine axis. The intensity of the intake, bypass, core and mixing noise sources is estimated from the image, provided the sources are well separated on the wavelength scale. The 'best squares' fit procedure is used to automate the source breakdown calculation by eliminating the source-image stage of data analysis, thereby permitting larger volumes of data to be processed. Numerical studies and practical results demonstrate that the method can be used at far lower frequencies than those for which individual source contributions could be discerned from a resolution limited source image. Far less comprehensive microphone arrays are required, since there is no general aliasing problem. Application of this technique to the separate core and jet mixing noise on a Viper engine yields a range of valuable data, previously unavailable; the technique is not restricted to a line array of point sources, but can be extended to an arbitrary array of either compact or noncompact sources. J.F.

A81-48621 * # **Turbomachinery noise studies of the AiResearch QCGAT engine with inflow control.** J. G. McArdle, L. Homyak, and D. D. Chrulski (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2049.* 16 p. 17 refs.

The AiResearch Quiet Clean General Aviation Turbofan engine was tested on a vertical lift fan facility to measure the acoustic performance of two inflow control devices (ICD) of similar design, and three inlet lips of different external shape. Far-field directivity patterns calculated by existing analyses were compared with the measured fan fundamental blade passing frequency (BPF/F/) and broadband data. Installing an ICD on an engine with hardwall ducts reduced the BPF(F) tone everywhere in the far-field. When the ICD was installed on an engine with active acoustic panels, tone reduction in the forward quadrant was comparable to that in the hardwall tests; in the aft quadrant, however, tone noise was attenuated by the large acoustic panels in the bypass duct to such a degree that the ICD had little effect. Tests to compare performance of ICDs with hardwall inlet ducts showed only minor differences in the BPF(F) directivity patterns, while broadband noise was the same for both. Forward-quadrant BPF(F) and broadband directivity patterns were found to be similar for the inlet lips tested with a hardwall inlet duct. At high fan speeds, however, the shape of the analytical multimodal tone pattern from the exhaust nozzle was flatter than the measured patterns. The sources of lobes from several propagating single modes found in the forward-quadrant BPF(F) data were attributed to rotor/strut interaction and the rotor-alone pressure field. J.F.

A81-48625 * # **Contributions to the theory of side edge flap noise.** M. S. Howe (Bolt Beranek and Newman, Inc., Cambridge, MA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2036.* 11 p. 17 refs. NASA-supported research.

High and low frequency asymptotic formulas are derived which express the acoustic frequency spectrum in terms of the wavenumber-frequency spectrum of surface pressure fluctuations on the upper surface of a part span flap, measured in-board of the side edge. Interpolations between the results are used to predict the field shape and its dependence on the subsonic forward flight speed over the whole frequency range. The radiation has the characteristics of a semibaffled dipole at small values of the Strouhal number based on the chord of the flap and the forward flight speed. The degree of Doppler amplification due to forward flight speed of the aircraft is dependent on the Strouhal number: the radiation efficiency of side-edge noise sources is governed by the value of the mean side-edge gap Strouhal number, and is larger when this number is small. Theoretical predictions extrapolated to full scale suggest that the noise generated at a single side edge can exceed that generated along the whole of the trailing edge of the flap by 3 dB. J.F.

A81-48626 * # **Prediction of jet exhaust noise on airframe surfaces during flight.** L. M. Butzel (Boeing Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2035.* 14 p. 16 refs. Research supported by the Boeing Commercial Airplane Co.; Contracts No. F33657-72-C-089; No. F33615-77-C-3035; No. NAS2-9328.

The behavior of pressure fluctuations measured on the airframe of a prototype high lift jet transport (YC-14) is presented. The data are characterized in terms of a particular jet exhaust flow field idealization, jet mixing noise, and exhaust shock noise. Generalized spectrum shapes and scaling relations for peak level and frequency of peak level are developed, and the frequency is found to depend on jet exhaust velocity and aircraft velocity. Comparisons are made with near-field engine exhaust noise of a conventional jet, and results suggest that the same two exhaust noises are important for both aircraft types. Surface fluctuating pressure data are assessed, and results suggest that the jet mixing and exhaust shock noise source characterizations for the YC-14 have useful applicability to conventionally configured jets. D.L.G.

A81-48627 # **The effect of vane-frame design on rotor-stator interaction noise.** P. Y. Ho (General Electric Co., Aircraft Engine Business Group, Evendale, OH). *American Institute of Aeronautics* *and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2034.* 11 p. 20 refs.

Test results of a conventional uniform outlet vane design and an integral vane frame are reported. A turbulence control structure installed over a 20-inch-diameter motor-driven fan inlet is used to determine the difference in overall noise levels. Aerodynamic and acoustic measurements are made for 12 min of recording at a tape speed of 7.5 in./sec, and a method for calculating the steady state potential field noise by struts and pylons is presented. It is found that integral vane-frame design causes blade passing frequency cut-on at low speeds. Rotor-stator spacing is observed as having a severe impact on rearward propagating noise in terms of broadband and tone levels; however, due to large rotor-stator spacing and a smaller rotor incidence angle for the vane-frame design, the overall difference in noise levels between the two configurations is insignificant. It is concluded that in actual engine design practice, an integral vane-frame design is acceptable when sufficient spacing is given between the rotor trailing edge and the vane-frame leading edge. D.L.G.

A81-48628 * # **Effects of blade-vane ratio and rotor-stator spacing on fan noise with forward velocity.** R. P. Woodward and F. W. Glaser (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2032.* 12 p. 30 refs.

A research fan stage is acoustically tested in an anechoic wind tunnel with a 41 m/sec tunnel flow. Two stator vane numbers giving cut-on and cut-off conditions are tested at three rotor stator spacings ranging from 0.5 to 2.0 rotor chords. Hot-film anemometer turbulence measurements are made at the leading edge of the stator for each spacing, and a crossed film anemometer is radially transversed to define streamwise and upwash characteristics of the rotor blade wakes. Trends in the acoustic results are observed in the front and aft quadrants at 80% design fan speed. Aft quadrant results demonstrate a fundamental tone 9 dB lower for the 25 vane stator than for the 11 vane stator, while overtone levels are 3 dB higher. The cut-off criterion strongly controls fundamental tone level at all spacings, and spacing trends of the wake-defect upwash component show good agreement with corresponding cut-on acoustic tone levels. D.L.G.

A81-48629 # **Flight test of the 747-JT9D for airframe and jet-flap interaction noise.** O. Kipersztok and G. Sengupta (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2037.* 10 p. 7 refs.

This paper describes the methodology used to isolate the individual airframe noise components and determine their relative contribution to the total noise radiated by a 747 aircraft with JT9D-7A engines at approach. The individual components are isolated using ensemble averaged flight test data. The spectral data are normalized on the basis of altitude, airspeed, temperature, and relative humidity. The noise radiated at approach is reconstructed from addition of individual components and compares very accurately, in level, spectral shape and directivity pattern, to the actual flyover. A comparison is made between each individual airframe noise component and their logarithmic sum, representing the synthesized total airframe component, and Fink's prediction method. The results of this study show that the landing gear, when isolated from configurations having the flaps retracted, is the major contributor to airframe noise. If the effect of flap deployment is included in the isolation of the landing gear noise component, this result could be altered. No evidence of significant jet-flap interaction noise is found for the 747-JT9D aircraft. (Author)

A81-48634 # **Comparative acoustic wind-tunnel measurements and theoretical correlations on subsonic aircraft propellers at full-scale and model-scale.** W. J. G. Trebble, J. Williams (Royal Aircraft Establishment, Aerodynamics Dept., Farnborough, Hants., England), and R. P. Donnelly (Royal Aircraft Establishment, Aerodynamics Dept., Farnborough, Hants.; Dowty-Rotol, Ltd., Cheltenham, England). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2004.* 15 p. 14 refs.

Experiments are performed on a Dowty-Rotol four-bladed R292 propeller at full scale in a 24 ft anechoic tunnel, and at quarter-scale on a geometrically similar model in a 1.5 m acoustic tunnel. Measurements of power, torque and thrust are simultaneously made with microphone recordings of the propeller noise signal. Third-octave and narrow-band spectra are analyzed in a range of rotational speeds up to a blade-tip Mach number of 0.75 with tunnel airspeeds up to 50 m/s. Variation of propeller nacelle incidence up to 10 deg has little effect on noise level, and the empirical relationship from tunnel full-scale tests correlates with measurements from external fuselage-mounted microphones on a twin propeller Shorts 330 aircraft, although installation effects raise the absolute level by 7 dB. The quarter-scale model has similar acoustic and aerodynamic characteristics to those of the full-scale propeller, and substantially better noise measurements are attainable in the 1.5 m acoustic tunnel than in the 24 ft anechoic tunnel. D.L.G.

A81-48635 * # **Comparison of predicted engine core noise with current and proposed aircraft noise certification requirements.** U. H. von Glahn and D. E. Groesbeck (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2053.* 11 p. 15 refs.

Predicted engine core noise levels for subsonic CTOL aircraft engines are compared with measured total aircraft noise levels and to the spectral envelope, with a peak at 400 Hz which is assumed to be shifted in flight by a Doppler shift in frequency. Preceived noise levels are computed for appropriate engine power settings at desired flight conditions, and reductions in sideline noise levels are made to account for jet and airframe shielding effects. Results indicate that core noise can provide a barrier to the proposed EPA stage 4 and 5 federal noise rules for wide-body aircraft, with the most severe core noise problem occurring at takeoff and sideline measuring stations. D.L.G.

A81-48636 # **Some modal-frequency spectra of fan noise.** T. G. Sofrin. *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1990.* 12 p.

Features of fan-compressor noise are described by means of modal-frequency spectra, which give both modal and frequency distributions of acoustic power. A simple form of spectral function is used, which allows fan noise spectral characteristics to be easily estimated in terms of design and operating characteristics. Examples of modal-frequency spectra are given for rotor-stator interaction, turboprop interactions, a two-stage fan, and inlet distortion interactions. Methods for reducing inflow turbulence present during ground tests are described, and the development of improved quiet fan designs is found to depend on the ability to measure mode structure. Several significant fan noises are illustrated, including examples of discrete frequency, multiple pure tone, and broadband noise. In addition, due to static operation producing strong inflow turbulence interactions, and unacceptably restrictive and expensive flight development testing, more effort is being placed on reducing static environmental effects. D.L.G.

A81-48637 * # **Assessment of inflow control structure effectiveness and design system development.** A. A. Peracchio (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2048.* 12 p. 5 refs. Contract No. NAS1-15085.

Inflow control structures used during static testing of fans are shown to minimize inflow distortions and thus stimulate the inflight flow field and noise generating mechanisms. Acoustic tests are conducted on a Pratt and Whitney aircraft JT9D engine with and without an inflow control structure. Raw data are corrected to 77 deg, and time is averaged over 0.5 second intervals. Use of an inflow control structure is found to significantly reduce blade passage frequency tone, while having little effect on twice blade passage frequency tones, and significantly improves agreement between static data projected to flight and flight data for the blade passage frequency fan tone. A design system is also presented, which prescribes structure shape, size and construction. D.L.G.

A81-48638 * # **Ground effects on aircraft noise for a wide-body commercial airplane.** W. L. Willshire, Jr. (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA,* *Oct. 5-7, 1981, Paper 81-1988.* 8 p. 10 refs.

Ground effects on noise from a high-bypass ratio engined aircraft are investigated. A 747 is flown at altitudes from 30 to 960 m past a 20-microphone array, and ground effects are calculated from noise measurements as a function of elevation angle and slant range. Results are given in terms of EPNL units and are compared with previous results of a turbojet-powered T-38 and SAE-recommended empirical lateral attenuation prediction procedures. Theoretical predictions are made based on a method developed by Pao et al. (1978) and are compared with both 747 and T-38 results, demonstrating good agreement although a consistent underprediction of peak measured attenuation is observed. Measured ground effects are found largest at 200 Hz, and no definite shielding differences are apparent for a directivity angle of 122.5 deg. Less lateral attenuation of effective perceived noise is measured for both aircraft and is attributed to the dominance of low-frequency noise in the source spectrum. D.L.G.

A81-48639 * # **Mixer nozzle aeroacoustic characteristics for the energy efficient engine.** P. R. Gliebe, G. T. Sandusky (General Electric Co., Aircraft Engine Group, Cincinnati, OH), and R. Chamberlin (NASA, Lewis Research Center, Transport Propulsion Office, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1994.* 11 p. NASA-supported research.

Aeroacoustic tests are conducted on scale model mixer nozzle configurations, a separate flow nozzle, and a baseline conical nozzle in an anechoic chamber free-jet facility to investigate exhaust system designs. Far-field acoustic data and exhaust jet plume aerodynamic data are obtained for various combinations of exhaust jet velocity and simulated flight speed, with corrected microphone data at a constant 12.2 m arc distance, and scaled acoustic data at a sideline distance of 457 m. It is found that jet plume aerodynamic and acoustic characteristics of lobed mixer exhaust systems are similar to those of a conical nozzle operating at the same specific thrust, although differences occur at high frequencies, where the sound pressure level of the mixer nozzle is 1-5 dB higher than that of a conical nozzle. In addition, no direct correlation is found between exit plane turbulence levels and plume development or acoustic characteristics for mixer exhaust configurations. D.L.G.

A81-48640 * # **Acoustic and turbulence measurements of a tone-excited jet with and without flight simulation.** K. K. Ahuja, J. Lepicovsky, and R. H. Burrin (Lockheed-Georgia Co., Marietta, GA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2007.* 12 p. 10 refs. Research supported by the Lockheed-Georgia Co.; Contract No. NAS3-21987.

Acoustic as well as turbulence measurements were made of tone-excited jets to obtain an understanding of the broadband noise augmentation mechanism. Results for both heated and unheated jets with and without flight simulation are presented for a range of excitation frequencies and levels, as well as for the zero order and first order spinning modes. It is argued that although the phase-locked large-scale turbulence structure is at the root of the noise amplification process, the actual noise generation mechanism lies in the small-scale turbulence. Results show that (1) the phase velocity of the excited large scale instability waves is subsonic relative to the ambient fluid and (2) broadband jet noise is almost uniform at all frequencies. Moreover, when the large-scale and small-scale structures are plotted against forward velocity (for a given upstream excitation level of 141 dB), the change in large-scale turbulence is negligible with forward velocity, whereas the small-scale turbulence decreases for both excited and unexcited jets. Also, the corresponding difference in far-field noise does not appear to change significantly, indicating that the changes in small-scale turbulence are responsible for jet noise amplification. J.F.

A81-48644 # **Prediction method for aeroacoustic loads on under the wing blown flaps.** D. Lohmann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung technische Akustik, Braunschweig, West Germany). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2038.* 11 p. 15 refs.

Regression analyses are performed based on fluctuating surface-pressure data from the McDonnell-Douglas YC-15 STOL prototype aircraft to develop a prediction scheme for aeroacoustic loads on under-the-wing blown flaps. Flight and engine exhaust Mach numbers, flap angle, and flight-altitude are used as primary parametrical variables to calculate third-octave band surface pressure level spectra and overall levels for any chord station on the lower surface of the wing/flap system. Experimental results indicate that the frequency range for 20-2000 Hz is most critical in terms of structural fatigue life, and a marked influence of altitude on overall fluctuating surface-pressure levels appears only in the range from 0 to 10,000 ft, while the difference is less than 2 dB between 10,000 and 30,000 ft. In the case of ground static, the aeroacoustic energy increases with the 3rd and 4th powers of the nozzle exit Mach number, while in the flight case, the energy increases with the 8th to 10th powers of the relative Mach number, which agrees well with predictions. D.L.G.

A81-48647 # **A novel airborne technique for free-field measurements of aircraft noise above the flight path with application to noise-shielding studies.** T. A. Holbeche and A. F. Hazell (Royal Aircraft Establishment, Aerodynamics Dept., Farnborough, Hants., England). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2028.* 12 p. 9 refs.

Wind-shielding effects for a TriStar airliner are deduced from a comparison of engine noise measured simultaneously above and below the flight path. Noise radiated upward is monitored by flying the aircraft beneath a large instrumented fiberglass sphere suspended from a hovering helicopter, while flyover noise at ground level is recorded conventionally. Predicted acoustic diffraction by the sphere results in good directivity and frequency response characteristics, allowing reliable free-field noise data to be readily derived from the fly-under. Experimental checks on this behavior at model and full-scale are reported, including the results of diffraction studies on a half-scale sphere in an anechoic room. Basic considerations regarding application of the technique to noise-shielding studies in flight are outlined and corrections to free-field conditions are evaluated for a range of typical frequencies and sound incidence angles. Most corrections are -6 dB and independent of the source distance, and efficient shielding by the sphere leads to a substantial reduction in helicopter background noise, which improves reliability of the aircraft noise measurements. D.L.G.

A81-48651 # **Effect of excitation on coaxial jet noise as observed by an elliptic mirror.** H. Y. Lu (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2044.* 9 p. 8 refs.

Coaxial model jets are excited internally by tone and broadband noise under high-bypass-ratio (HBPR) engine exhaust hot gas conditions. The system consists of an internal noise injection section installed 4 ft from the nozzle exit, and 16 Altec horn drivers rated at 50 W per driver. Rotational motion is remotely controlled, and transverse recording is made at 60, 90, 120, and 140 deg. Amplification is found to depend on nozzle configuration, gas conditions, excitation frequencies, and excitation levels and location. HBPR jets without internal acoustic excitation are also examined by using the elliptic mirror, and the secondary ambient premerged jet noise is found to dominate the upstream angles. Acoustic excitation in the secondary duct is most effective due to the sensitivity of the outer shear layer, where jet noise amplification occurs in the subharmonic in a number of cases. In addition, due to increased mixing and higher noise levels of the excited jet, the noise source region is more compact than in unexcited jets, and comparisons of excess jet noise characteristics with HBPR engine noise data indicate that HBPR engines have excess noise. D.L.G.

A81-48653 # **High bypass ratio engine noise component separation by coherence technique.** B. N. Shivashankara (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2054.* 12 p. 13 refs.

Aft fan, core and jet noise components of a large high bypass ratio engine are separated by means of a signal enhancement technique. Simultaneous signals from three or more microphones are used, which are assumed to have a common correlated part and uncorrelated extraneous noise at each location. Advantages include the internal-to-farfield coherence technique used for component separation when the in-duct microphone signal is contaminated by extraneous noise, and the separation of jet noise from core and fan noise using only far-field microphones. The validity of the technique is demonstrated by a scale proof-of-concept experiment, and the technique is applied for use with signals from three microphones external to the engine. Higher-frequency fan tones are well correlated between fan duct and far-field microphones, which indicates that higher-frequency fan noise tones, such as the blade passage frequency tone, are due to distributed and well correlated sources. D.L.G.

A81-48744 # **Choice of optimal parameters of a gyrovertical on the basis of a standard program (Vybor optimal'nykh parametrov girovertikali po tipovoi programme).** M. A. Sergeev, V. A. Iablonskaia, and A. A. Kubenskii (Leningradskii Institut Tochnoi Mekhaniki i Optiki, Leningrad, USSR). *Priborostroenie,* vol. 24, Aug. 1981, p. 78-84. In Russian.

Algorithms are presented for computing the mean-square error of a gyrovertical with a mixed correction characteristic on the basis of a standard program. A method for choosing the optimal parameters of the gyrovertical is described. B.J.

A81-48847 **Unrepresentative temperatures at a first-order meteorological station - Washington National Airport.** J. L. Foster and R. J. Leffler. *American Meteorological Society, Bulletin,* vol. 62, July 1981, p. 1002-1006. 9 refs.

An examination of temperature records from the three major airports in the Washington, DC, area and from a network of volunteer meteorological observers reveals an exceptional warmth at Washington's National Airport and indicates that National Airport does not represent properly temperature conditions normally experienced in the Washington Metropolitan Area. Temperature differences between National Airport and its environs and other meteorological stations in the Middle Atlantic region can be attributed primarily to the location of National Airport within Washington's heat island and to the proximity of its temperature sensors to the modifying effects of the Potomac River. (Author)

A81-49075 **More fight for the Fighting Falcon.** A. T. Lloyd. *Air International,* vol. 21, Oct. 1981, p. 161-170, 202, 203.

A status report is given on technical developments made and operational experience gained in the first five years of F-16 use by U.S., Europan, and Israeli air forces. Attention is given the manufacturer's Multinational Staged Improvement Program (MSIP), whose three stages will cover aircraft produced until 1989, aimed at the gradual introduction of advanced avionics and weapon systems. Consideration is also given the U.S. Air Force's F-16 flight training and maintenance programs, Europan F-16 construction schedules, operation to date by the Belgian, Dutch, Danish and Norwegian air forces, and two advanced development programs: (1) the Supersonic Cruise Aircraft Modification Program, involving a lengthening of the fuselage and incorporation of a large-area cranked arrow wing, while maintaining 93% commonality with the current airframe and (2) the Advanced Fighter Technology Integration demonstrator, employing control-configured vehicle technology and canard control surfaces. O.C.

A81-49076 * # **Structural synthesis - Its genesis and development.** L. A. Schmit (California, University, Los Angeles, CA). *AIAA Journal,* vol. 19, Oct. 1981, p. 1249-1263. 101 refs. NASA-supported research.

An historical account is given of the development, from its conception in 1960, of the structural synthesis method. While synthesis techniques lag behind analytical ones in both sophistication and application, the structural design procedures created by combining finite element analysis and mathematical programming algorithms have progressed to the point of maturity. As in the case of finite element analysis, use and acceptance of structural synthesis methodology depends on the development and distribution of easily used and well-documented, production-quality computer programs. Attention is given such elementary applications of synthesis methods as the three-bar truss, an integrally stiffened waffle plate, a stiffened cylindrical shell, aircraft fuselage window panels, the structural efficiency of graphite-epoxy hat-stiffened panels, and an idealized delta wing. O.C.

A81-49161 # **Propulsion energy for tomorrow's aviation (Antriebsenergie für die Luftfahrt von morgen).** V. M. Akimov (Tsentral'nyi Nauchno-Issledovatel'skii Institut Aviatsionnogo Motorostroeniia, Moscow, USSR). *(Grazhdanskaia Aviatsiia,* no. 2, 1980.) *Technisch-ökonomische Information der zivilen Luftfahrt,* vol. 17, no. 2, 1981, p. 68-71. In German. (Translation).

One of the objectives of the Central Institute for the Construction of Aircraft Engines in the USSR involves the study of the characteristics for the aircraft propulsion system to be used at the end of the 20th and the beginning of the 21st century. Conclusions reached in this study are discussed. Further improvements in the efficiency of new propulsion units will be possible on the basis of a high bypass ratio and better operational parameter values. It is pointed out that the design of engines of the new generation will require the solution of complex problems concerning gas dynamics, cooling, and materials. The efficiency of turbine and compressor must be further enhanced and the space remaining between moving and stationary parts in compressor and turbine must be reduced. It is expected that, as a result of these steps, it will be possible to obtain a further reduction in fuel consumption by about 10 to 12%. Attention is also given to approaches for increasing the production of aircraft fuels on a hydrocarbon basis, and possibilities for an employment of hydrogen as aircraft fuel. G.R.

A81-49173 **Combat cockpit design.** *Flight International,* vol. 120, Sept. 26, 1981, p. 939-942.

A status report is presented on attempts to give NATO single-seat fighter pilots, whose aircraft are currently being produced at a rate four times greater than that of two-seat combat aircraft, the greatest range of control capabilities against increasingly sophisticated Soviet antiaircraft systems. After surveying the threat posed by four new Soviet SAM systems, the Ram-J, -K and -L aircraft nearing production and the AWACS/Super Foxbat interception system, recent developments in digital radar mode and weapons control, displays, track-while-scan radar, ECM, and automatic, built-in testing of aircraft systems are described. Attention is given design solutions for the F-16, F-18 and AV-8B aircraft, as well as related developments in the A-10 and F-15. Detailed descriptions are given of the WDNS-141 weapon-delivery and navigation display system and the AV-8B joystick- and throttle-mounted, 'hands on' control devices. O.C.

A81-49209 **A process for protecting gas turbine blade cooling passages against degradation.** J. E. Restall, B. J. Gill (National Gas Turbine Establishment, Farnborough, Hants., England), C. Hayman, and N. J. Archer (Fulmer Research Institute, Ltd., Stoke Poges, Bucks., England). In: Superalloys 1980; Proceedings of the Fourth International Symposium, Champion, PA, September 21-25, 1980. Metals Park, OH, American Society for Metals, 1980, p. 405-411. 5 refs.

A new process for the protection of turbine blades and vanes on both external and internal surfaces has been evolved. The surfaces are metallized by pressure-pulsing the coating gases from a near-conventional cementation pack. Penetration occurs into the internal cooling channels which are inaccessible to most other coating processes. Up to 1000 small turbine blades can now be simultaneously pulse aluminized in an industrial plant. (Author)

A81-49374 # **Performance prediction for light airplanes.** E. V. Laitone (California, University, Berkeley, CA). *Journal of Aircraft,* vol. 18, Nov. 1981, p. 988-991. 6 refs.

Oswald's (1932) method for estimating the performance of aircraft with fixed-pitched propellers is extended to modern aircraft with variable pitch propellers. A parabolic variation of the thrust with the flight velocity makes possible the development of explicit relations for the maximum level flight speed and the maximum rate of climb at any altitude up to the absolute ceiling. It is shown that errors may occur if the limitations of the best-fit parabola are exceeded, and that the performance calculations are greatly simplified by representing the propulsive thrust by a parabola. D.L.G.

A81-49375 * # **Influence of landing gear flexibility on aircraft performance during ground roll.** M. M. Sivaramakrishnan (NASA, Langley Research Center, Hampton, VA; Indian Institute of Technology, Bombay, India). *Journal of Aircraft,* vol. 18, Nov. 1981, p. 991, 992.

An analysis is made of the influence of landing gear deflection characteristics on aircraft performance on the ground up to rotation.

A quasi-steady dynamic equilibrium state is assumed, including other simplifying assumptions such as calm air conditions and normal aircraft lift and drag. Ground incidence is defined as the angle made by the mean aerodynamic chord of the wing with respect to the ground plane, and equations are given for force and balance which determine the quasi-equilibrium conditions for the aircraft during ground roll. Results indicate that the landing gear deflections lead to a substantial increase in the angle of attack, and the variation in the ground incidence due to landing gear flexibility could be as much as + or - 50%, and the reduction in tail load requirements almost 25%. D.L.G.

A81-49378 **Compact and highly sensitive fluorescence lidar for oceanographic measurements.** U. Gehlhaar, K. P. Gunther, and J. Luther (Oldenburg, Universität, Oldenburg, West Germany). *Applied Optics,* vol. 20, Oct. 1, 1981, p. 3318-3320. 12 refs. Research supported by the Deutsche Forschungsgemeinschaft.

A compact and highly sensitive helicopter-borne fluorescence lidar is described. The single channel system is based on a high power, tunable laser. From an altitude of 70 m, selective detection of the tracer dye rhodamine B of less than 10 to the -10th g/cu cm in natural waters is achieved. (Author)

A81-49462 # **Automation of air traffic control processes (Avtomatizatsiia protsessov upravleniia vozdushnym dvizheniem).** Iu. P. Darymov, G. A. Kryzhanovskii, V. A. Solodukhin, V. G. Kiv'ko, and B. A. Kirov. Moscow, Izdatel'stvo Transport, 1981. 400 p. 229 refs. In Russian.

The work presents a systematic exposition of the principles underlying the automation of ATC processes as well as the principles of the technical implementation of automatic ATC systems. Particular consideration is given to the development of mathematical models for ATC processes, the evaluation of the efficiency of automatic ATC systems, and the development of algorithms for the automation of ATC processes. B.J.

A81-49471 # **Stress concentration in elements of aircraft structures (Kontsentratsiia napriazhenii v elementakh aviatsionnykh konstruktsii).** R. R. Mavliutov. Moscow, Izdatel'stvo Nauka, 1981. 144 p. 216 refs. In Russian.

The book deals with methods of calculation and experimental determination of stress concentrations in typical elements of aircraft structures. Emphasis is placed on problems of stress concentration in parts subjected to elastic, plastic, and creep deformation under complex loading conditions. The effect of loading history is evaluated. Computer algorithms and programs for stress calculation are presented together with design optimization guidelines. V.L.

A81-49475 # **Design of production processes for flight-vehicle engines (Proektirovanie tekhnologicheskikh protsessov proizvodstva dvigatelei letatel'nykh apparatov).** I. A. Ivashchenko. Moscow, Izdatel'stvo Mashinostroenie, 1981. 224 p. 22 refs. In Russian.

Principles underlying the design of production processes for aircraft and rocket engines are examined. Particular attention is given to metal-treatment accuracy, the quality of the surface layers of engine parts, tolerances, and improved (particularly automated) methods for the mechanical treatment of engine parts. B.J.

A81-49575 # **Commercial airliners - Design and flight operation (Las aeronaves comerciales - Diseño y operación de vuelo).** M. Cuesta Alvarez. *IAA/Ingeniería Aeronáutica y Astronáutica,* vol. 33, Aug.-Sept. 1981, p. 17-34. In Spanish.

After a brief review of historical trends in jet airliner range and passenger-carrying capacity, consideration is given to a variety of topics in airliner design. These include: (1) sizing, with attention to the market opportunities that will exist until the year 2000 for medium-range aircraft with capacities in the 130-160 and 160-200 seat categories; (2) configurations, with stress on the drag reduction and structural load alleviation that may be derived from supercritical profile wings; (3) structures, with emphasis on the role that may be played by such advanced materials as the 7000 series aluminum alloys and carbon- and boron-reinforced composites; (4) high-bypass turbofan engine design; (5) active control technology for flutter suppression and gust load alleviation; and (6) the determination of flight profiles optimized for maximum range and for minimum direct operating costs. O.C.

A81-49727 # **The effect of flight and the presence of an airframe on engine exhaust noise.** S. Bashforth (Rolls-Royce, Ltd., Derby, England). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2029.* 13 p. 15 refs.

A full-scale static and flight test program using an HS 125 aircraft with an RR Viper 601 turbojet was carried out in order to explain the anomalies found between full-scale in-flight exhaust noise studies and model simulations. Both acoustically lined and unlined engine tailpipes were tested, and extensive installation studies were conducted using a replica tail assembly. Source location techniques were used to determine core noise levels over a wide range of frequencies. It is shown that the discrepancy between the static and flight tests was due to a number of noise-producing and/or affecting features of the aircraft/aero engine combination which were not incorporated into the analyses of the data: static tests conducted at NASA Ames demonstrated the importance of installation effects, and flight tests revealed that airframe self-noise can cause a significant amount of the total noise in small aircraft. J.F.

A81-49728 * # **Flight effects on supersonic convergent-divergent nozzle jet noise.** J. Wat and V. Sarohia (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2027.* 9 p. 12 refs.

The influence of forward flight on the noise generation from convergent-divergent (C-D) nozzle flows was determined experimentally. The experiments were performed in an anechoic chamber using a 2.03 cm diameter C-D nozzle with a design Mach number of 1.4 in a 25 cm diameter free jet flow. Far-field noise measurements and spectral analyses were carried out and visualization of the jet shock structure was made by a spark shadowgraph technique. Jet noise from supersonic C-D nozzle flows under forward flight was found to depend critically on the flight velocity and nozzle pressure ratio. Noise reduction up to 20 dB was observed in the rearward quadrant under flight; excess noise in the forward quadrant under flight resulted from relatively high frequency noise sources in the jet flow field. Screech tones, observed from overexpanded C-D nozzle flows, were suppressed during the simulated flight flow. J.F.

A81-49729 * # **Noise radiated from inverted velocity profile jets under simulated flight.** R. A. Petersen and V. Sarohia (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2026.* 8 p. 13 refs. Contract No. NAS7-100.

Measurements were made of the noise radiated by an inverted profile coannular jet. The measurements were made inside an anechoic chamber and forward flight was simulated with an open jet surrounding a coannular nozzle. The diameters of the center and the annular nozzles were 1.27 cm and 2.03 cm, respectively. The open jet wind tunnel was 17.1 cm in diameter and could be operated at speeds up to 150 m/sec. Noise measurements were made in the acoustic far field at several spherical angles ranging from 20 deg to 120 deg relative to the jet axis. Flow through the center jet decreased the noise radiated by the annular jet. The addition of forward velocity further decreased the noise, and the two noise reductions seem to be additive. Measurements of the mean velocity profile demonstrate that forward flight reduced the growth rate of the high speed annular jet, and that center flow reduced the rate of merging of the annular jet. (Author)

A81-49730 # **Shielding concepts for jet noise.** R. L. M. Wong, W. G. Richarz, and H. S. Ribner (Toronto, University, Toronto, Canada). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2020.* 13 p. 33 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada, Grant No. AF-AFOSR-75-2808B.

Point source shielding is investigated as a function of frequency and source/observer positions for a semiinfinite shield. Several concepts for jet noise shielding are explored, and model experiments center on semiinfinite sugar scoop, and infinite planar shields. Results are synthesized into a predictive algorithm for jet noise shielding, in which the jet is modeled as a line distribution of incoherent sources with narrow-band frequency. Edge noise is minimized by hyperbolic cutouts and hybrid shields, and shielding attenuation increases steadily with frequency following low-frequency enhancement by edge noise. Calculated ground contours of peak flyover perceived noise level (PNdB) show a substantial contraction due to shielding which reaches 66% for one sugar scoop shield for the 90 PNdB contour. Results show good agreement with companion analytical calculations, and the mean of two predictive versions agrees with the experimental results from 1 to 1.5 dB up to moderate frequencies. D.L.G.

A81-49731 * # **Noise shielding by a hot subsonic jet.** A. Vijayaraghavan and S. P. Parthasarathy (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2018.* 6 p. 5 refs. Contract No. NAS7-100.

An analysis is conducted of the shielding of the noise emitted by a high speed round jet by a hot, subsonic, semicircular jet. A plane wave front in the primary jet is resolved into elementary plane waves which undergo multiple reflections at the jet boundaries of the primary and the shielding jets. The jet boundaries are idealized to be vortex sheets. The far field sound is evaluated asymptotically by a superposition of the waves that penetrate the shielding jet. The angular directivities are plotted for several values of jet temperature and velocity to examine the effectiveness of shielding by the semicircular jet layer. (Author)

A81-49732 # **Investigation of performance, noise and detectability characteristics of small-scale remotely piloted vehicle /RPV/ propellers.** D. S. JanakiRam (Hughes Helicopters, Inc., Culver City, CA) and B. W. Scruggs (U.S. Army, Applied Technology Laboratories, Fort Eustis, VA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2005.* 15 p. 14 refs.

Several small-scale propeller configurations, applicable to a conceptual remotely piloted vehicle, were tested under static and simulated forward flight conditions in a wind tunnel to determine their performance, acoustic, and detectability characteristics. The propellers tested had tractor, pusher, and ducted configurations, designed to develop 4 thrust horsepower at a cruise speed of 75 knots at 4000 ft altitude and 95 F. The acoustic data were used to determine the slant range and altitude of no detection of each propeller configuration. The acoustic and detectability characteristics of small-scale propellers were found to be significantly different from those of the large-scale propellers; this is explained by low disk loading or the low operating Reynolds numbers of the propellers. An increase in forward velocity caused a significant drop in SPLs at higher harmonics of the blade passage frequency. Tip speed had a strong effect on noise and detectability in forward flight: most of the propellers were detected at either the first or second harmonic of their blade passage frequency. Three-bladed propellers were generally less detectable than two- or four-bladed propellers for most of the forward velocities. Finally, ducted and pusher propeller configurations were more detectable and less efficient than their free and tractor counterparts. J.F.

A81-49736 * # **An iterative finite element-integral technique for predicting sound radiation from turbofan inlets.** S. J. Horowitz, R. K. Sigman, and B. T. Zinn (Georgia Institute of Technology, Atlanta, GA). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1981.* 10 p. 23 refs. Grant No. NsG-3036.

A new iterative solution technique for predicting the sound field radiated from a turbofan inlet is presented. The sound field is divided into two regions; the sound field within the inlet which is computed using the finite element method and the radiation field outside the inlet which is calculated using an integral solution technique. A 'unified' solution is obtained by matching the finite element and integral solutions at the interface between the interior and exterior regions. The applicability of the iterative technique is demonstrated by considering several simple cases for which exact or 'classical' solutions for the sound field are available. These examples show that the proper solution is obtained within five iterations. The overall accuracy of the method is demonstrated by comparison with experimental data. (Author)

A81-49743 * # **An improved prediction method for noise generated by conventional profile coaxial jets.** J. R. Stone, D. E. Groesbeck, and C. L. Zola (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-1991.* 33 p. 13 refs.

A semi-empirical model for predicting the noise generated by conventional-velocity-profile jets exhausting from coaxial nozzles is presented and compared with small-scale static and simulated flight data. The present method is an updated version of that part of the original NASA Aircraft Noise Prediction (ANOP) Program (1974) relating to coaxial jet noise. That method has been shown to agree reasonably well with model and full-scale experimental data except at high jet velocities in the region near the jet axis. Improvements to the basic circular jet noise prediction have been developed since that time which improve the accuracy, especially at high jet velocity and near the jet axis, and are incorporated into the coaxial jet procedure in this paper. The new procedure is more theoretically based and has also been improved by some empirical adjustments. (Author)

A81-49877 **Aircraft electricity and electronics /3rd edition/.** R. D. Bent and J. L. McKinley. New York, McGraw-Hill Book Co., 1981. 365 p. $16.95.

Fundamentals of electricity are considered along with magnetism and electromagnetism, capacitors and inductors, alternating current, and electric measuring instruments. Batteries are examined, taking into account voltaic cells, alkaline cells, nickel-cadmium cells, the theory of the lead-acid cell, aspects of lead-acid battery construction, battery design features, nickel-cadmium storage batteries, and a troubleshooting chart for nickel-cadmium batteries. A description is presented of generator theory, dc generators and controls, electric motors, the installation and maintenance of electrical systems, the principles of electronics, radio transmitters and receivers, electric instruments, and electronic control systems. Other topics considered are related to weather warning systems, communication and navigation systems, and automatic pilots and landing systems. Attention is given to radar, interphone communications, the passenger address and entertainment system, a high-frequency communication system, a Selcal decoder, Federal Communications Commission regulations, automatic direction-finder systems, the instrument-landing system, the microwave landing system, TACAN, long-range navigation systems, and an inertial navigation system. G.R.

A81-49900 # **Model following control of gas turbine engines.** R. V. Monopoli (Massachusetts, University, Amherst, MA). *ASME, Transactions, Journal of Dynamic Systems, Measurement, and Control,* vol. 103, Sept. 1981, p. 285-289. 18 refs. Research supported by the United Technologies Corp.

A technique, which is based on Liapunov's direct method (Kalman and Bertram, 1960), is described for designing a control system for a nonlinear gas turbine engine. The technique proceeds to the derivation of the control input directly from the nonlinear, time-varying differential equations, rather than from a linearized version of the engine dynamics. The control system resulting from this approach forces certain engine variables to track the corresponding variables of an ideal model of the engine specified by the designer. A brief description of the theory is presented, and the structure of the model is described. Application of the technique to a gas turbine engine is illustrated, using a full nonlinear digital simulation of a representative advanced technology engine. Simulation results are presented and include data indicating the performance achieved when the control algorithm was used. K.S.

A81-49928 # **The use of direct lift control of an aircraft in a guided landing run (Ob ispol'zovanii nepostredstvennogo upravleniia pod'emnoi siloi samoleta v rezhime direktornogo zakhoda na posadku).** O. Iu. Alasheev, V. D. Osorgin, V. G. Pavlov, L. A. Semakov, and N. L. Sokolov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 13-18. 7 refs. In Russian.

The paper examines the possibility of using direct lift control to reduce the control time of the guided landing run under the condition that a satisfactory quality of the transient process be maintained. The synthesis of the guided control system is described in detail, and the precision of the technique under consideration is examined. B.J.

A81-49930 # **The effect of the skewness of the skin panels on stresses in conical wings (Vliianie nepriamougol'nosti panelei obshivki na napriazheniia v konusnykh kryl'iakh).** M. B. Vakhitov and L. M. Koniukhova. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 22-27. 9 refs. In Russian.

A theoretical study is presented of the effect of additional normal stresses, arising in the case of the shear of skewed skin panels, on the stressed state of a conical wing. A discrete-continuum model is used to obtain a system of integrodifferential equations which are solved by the method of integrating matrices. B.J.

A81-49935 # **Geometrically nonlinear theory for calculating thin rods of a wing profile (Geometricheski nelineinaia teoriia rascheta tonkikh sterzhnei kryl'evogo profilia).** V. A. Pavlov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 44-50. 11 refs. In Russian.

The paper develops a theory of strength calculations of thin rectilinear rods of a wing profile of invariant cross-section shape; the spatial displacements of these rods are commensurable with their transverse dimensions. Deformations in local axes of rod elements are determined by generalized Kirchhoff-Klebsch relations. B.J.

A81-49937 # **Strength calculation of thin-wall rods of significant taper (Raschet na prochnost' tonkostennykh sterzhnei znachitel'nogo suzheniia).** V. G. Shataev. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 55-60. 7 refs. In Russian.

The paper examines a thin-wall cantilever beam structure consisting of longitudinal ribs connected by skin panels and transverse diaphragms. General equations are obtained for calculating the strength of this structure, with allowance for nonuniform heating, plastic deformation, and creep in the case of considerable taper. The physically nonlinear problem is reduced to a succession of linear problems by the use of the method of fictitious loads, secants, and tangential moduli. B.J.

A81-49940 # **Parametric synthesis of an automatic system for flight-vehicle stabilization (K parametricheskomu sintezu avtomata stabilizatsii letatel'nykh apparatov).** A. I. Bogomolov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 69-72. In Russian.

A81-49943 # **Realization of a method of extremal targeting in a problem of aircraft landing control (O realizatsii metoda ekstremal'nogo pritselivaniia v zadache upravleniia samoletom na posadke).** V. M. Kein, A. N. Parikov, and M. Iu. Smurov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 79-82. In Russian.

An algorithm is developed for aircraft terminal guidance which realizes the method of extremal targeting. The proposed algorithm was tested by a simulation of aircraft landing control in the case of extremal disturbances. The algorithm is found to satisfy prescribed speed and memory requirements. B.J.

A81-49946 # **Choice of the optimal angular velocity of the twist of a flight vehicle (O vybore optimal'noi uglovoi skorosti zakrutki letatel'nogo apparata).** O. A. Privarnikov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 102-104. In Russian.

During the twist of a flight vehicle, i.e., a rocket, relative to the longitudinal axis at the moment of separation from the booster, the rocket retains its orientation in the extraatmospheric part of the trajectory if the angular velocity of the twist considerably exceeds the transverse components of velocity. This paper considers the selection of the optimal twist velocity on the basis of minimum total deviation in range. B.J.

A81-49948 # **Calculation of the aerodynamic characteristics of a deformable wing, moving near a screen (K raschetu nelineinykh aerodinamicheskikh kharakteristik deformiruemogo kryla, dvizhushchegosia vblizi ekrana).** L. G. Tsvetkov. *Aviatsionnaia Tekhnika,* no. 2, 1981, p. 107-111. In Russian.

A theoretical study is presented of the motion of a thin wing at low subsonic velocity near a screen for low rates and amplitudes of the change of the kinematic parameters and deformation of the lifting surface. Particular attention is given to the effect of the three-dimensional motion on the formation of a vortex sheet behind the wing. B.J.

A81-49949 # **Hydrogen engines (Dvigateli na vodorode).** V. P. Barmin (Moskovskoe Vysshee Tekhnicheskoe Uchilishche, Moscow, USSR), I. L. Varshavskii, and V. V. Goncharov (Akademiia Nauk SSSR, Institut Mashinovedeniia, Moscow, USSR). *Priroda,* Sept. 1981, p. 22-29. In Russian.

The development of internal combustion engines fueled by hydrogen or hydrogen mixtures is reviewed. The first systematic investigations in the 1920s of a one-cylinder engine with variable compression ratio, which demonstrated the possibility of qualitatively regulated hydrogen combustion at any range of loading, resulting in a greater engine efficiency, is discussed, and problems of premature ignition encountered due to the use of pure hydrogen fuel are noted along with a possible solution in the use of a special injector for the direct delivery of the hydrogen to the cylinder which, however, leads to strong knocking. Attention is then given to work begun in 1974 on an experimental one-cylinder hydrogen-air engine with various degrees of compression and hydrogen supplied from ferrosilicon and water, the improvement of gasoline engine operating efficiency by 5-10% additions of hydrogen, hydrogen addition to diesel fuels, and hydrogen addition to improve the carbon monoxide, hydrocarbon and NO(x) emissions levels of aircraft gas turbine engines. A.L.W.

A81-49973 **Civil head-up displays - Coming up fast.** M. Lambert. *Interavia,* vol. 36, Oct. 1981, p. 984, 985.

A survey is made of operational experience to date with partial head-up display (HUD) systems installed in commercial aircraft. Attention is given these systems' certification for Category 3 operation. The systems described are the WGD 1, which is in service aboard A300 and 737-200 aircraft; the visual approach monitor (VAM), allowing ground-roll guidance in visibilities as low as 75 m; and the 193M electromechanical HUD for Mercure aircraft. Emphasis is given a recent HUD design, intended for DC-9 Super 80 airliners, which may be used during landing and take-off ground roll, climb, cruise, descent, instrument landing system approach, visual approach, and go-around. This HUD contains symbols indicating the autopilot's maneuvering capability in relation to the approach path, the phase of the approach, and the autopilot mode state. O.C.

A81-49974 **Sukhoi Su-24 Fencer - The Soviet Tornado.** G. Lafon. *Interavia,* vol. 36, Oct. 1981, p. 997-999.

Dimensional data and operational capabilities are deduced from photographs of the Soviet Su-24 Fencer interdiction/attack aircraft and from extrapolation of the characteristics of such comparable NATO aircraft as the F-111 and Tornado. After an examination of (1) the design's basic characteristics in light of the aerodynamic principles and structural requirements of low-level, high subsonic speed penetration missions, (2) the aerodynamic advantages and penalties of the large glove-area, variable incidence wing, and (3) the propulsion system difficulties resulting from deep, narrow air intakes intended to minimize radar cross-section, it is concluded that the Fencer is constrained to the interdiction strike mission, with little advantage at the high angles of incidence called for by air-to-air combat. In this, the Fencer compares unfavorably with the more versatile F-111 and Tornado. O.C.

A81-49975 **The Lear Fan 2100.** J. P. Geddes and D. Wood. *Interavia,* vol. 36, Oct. 1981, p. 1029-1033.

The structural, aerodynamic and propulsion system design features of the Lear Fan 2100 turboprop aircraft are described. The design incorporates two 850 shp turboshaft engines driving a four-bladed pusher propeller through a single transmission. Attention is given the all-graphite/epoxy composite construction of the fuselage and wings, designed for a 15,000-hour service life at high loads and 15,000 cabin pressure cycles, with a safety factor of 2.0 rather than the customary 1.5. Despite the novel materials employed, the structure is of a conventional, semimonocoque design that employs the stringers and frames of aluminum alloy aircraft. Also considered is the joint financing of the aircraft's development program by entrepreneurs and the British government, and the establishment of construction facilities in Northern Ireland. O.C.

A81-49976 # **Graphite/polyimide augmentor and nozzle components.** T. E. Schmid (United Technologies Corp., Pratt and Whitney Aircraft Group, West Palm Beach, FL). *AIAA, SAE, and*

A81-49979

ASME, Joint Propulsion Conference, 17th, Colorado Springs, CO, July 27-29, 1981, AIAA Paper 81-1358. 13 p. 5 refs.

Two composite applications for the augmentor and nozzle section of advanced military gas turbine engines were designed, fabricated and tested to determine the cost and weight savings potential and to demonstrate the viability of using organic matrix composites as substitues for sheet metal titanium structures. One of these components, the external nozzle flap, is currently undergoing flight service testing and may be considered for incorporation into the engine bill-of-material. Design approaches, configuration constraints, fabrication methods, and component test results are presented. (Author)

A81-49979 # **Comparison of computational and experimental jet effects.** J. L. Jacocks, W. L. Peters, and F. C. Guyton (ARO, Inc., Arnold Air Force Station, TN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 17th, Colorado Springs, CO July 27-29, 1981, AIAA Paper 81-1492*. 9 p. 11 refs.

Computations were made for transonic flow over a nozzle afterbody with a real plume. The effects of parameters such as nozzle pressure ratio, plume stagnation temperature, and interior nozzle shape on afterbody drag were quantified and compared with available experimental data. Remarkable agreement between the computational and experimental results is demonstrated, including the drag minimum associated with low nozzle pressure ratios and the absolute dependence of drag on temperature. The computer program used for the calculations is an axisymmetric modification of Diewert's planar Navier-Stokes program and utilizes a mixed explicit-implicit MacCormack algorithm with an algebraic turbulence model. (Author)

STAR ENTRIES

N81-32117*# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering and Mechanics
WIND-TUNNEL STUDIES OF ADVANCED CARGO AIRCRAFT CONCEPTS Final Report, 22 Jun. 1979 - 21 Jun. 1980
D. M. Rao and G. L. Goglia Sep. 1981 17 p refs
(NCC1-9)
(NASA-CR-164833) Avail: NTIS HC A02/MF A01 CSCL 01A

Accomplishments in vortex flap research are summarized. A singular feature of the vortex flap is that, throughout the range of angle of attack range, the flow type remains qualitatively unchanged. Accordingly, no large or sudden change in the aerodynamic characteristics, as happens when forcibly maintained attached flow suddenly reverts to separation, will occur with the vortex flap. Typical wind tunnel test data are presented which show the drag reduction potential of the vortex flap concept applied to a supersonic cruise airplane configuration. The new technology offers a means of aerodynamically augmenting roll-control effectiveness on slender wings at higher angles of attack by manipulating the vortex flow generated from leading edge separation. The proposed manipulator takes the form of a flap hinged at or close to the leading edge, normally retracted flush with the wing upper surface to conform to the airfoil shape. A.R.H.

N81-32118# National Aerospace Lab., Tokyo (Japan).
ON THE SPANWISE UNIFORMITY OF WIND TUNNEL TEST DATA OF TRANSONIC AIRFOILS
Tadashi Ito, Kooichi Suzuki, and Nobuhiko Kamiya 1981 46 p refs In JAPANESE; ENGLISH summary
(NAL-TR-665; ISSN-0389-4010) Avail: NTIS HC A03/MF A01

For flows of free stream Mach numbers below the drag divergence Mach number, the spanwise uniformity of the section drag coefficient is good in the region around the center section. Although the spanwise uniformity is bad for flows of freestream Mach numbers above that, the drag divergence Mach number can be obtained accurately. In order to improve the spanwise uniformity of the section drag coefficient, it would be necessary to survey the wake at a station close to the trailing edge rather than at a station 1-3 chords downstream of the trailing edge, as was done in this experiment. The spanwise uniformity of pressure distribution and of section lift coefficient is fairly good in the region around the center section. The spanwise uniformity is better at Mach numbers below M sub CD than at Mach numbers above M sub CD. T.M.

N81-32119*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF SWEEP AND ASPECT RATIO ON THE LONGITUDINAL AERODYNAMICS OF A SPANLOADER WING IN AND OUT OF GROUND EFFECT
Scott O. Kjelgaard and John W. Paulson, Jr. Jun. 1981 166 p refs Revised
(NASA-TM-80199) Avail: NTIS HC A08/MF A01 CSCL 01A

A wind tunnel investigation was conducted in the Langley 4 by 7 meter tunnel to determine the effects of leading edge sweep, aspect ratio, flap deflection, and elevon deflection on the longitudinal aerodynamic characteristics of a span distributed load advanced cargo aircraft (spanloader). Model configurations consisted of leading edge sweeps of 0, 15, 30 and 45 deg and aspect ratios of approximately 2, 4, 6, and 8. Data were obtained for angles of attack of -8 to 18 deg out of ground effect and at angles of attack of -2, 0, and 2 deg in ground effect at Mach number equal 0.14. Flap and elevon deflections ranged from -20 to 20 deg. The data are represented in tabulated form. M.G.

N81-32121*# George Washington Univ., Washington, D.C. School of Engineering and Applied Sciences.
PROGRAM OF RESEARCH IN LAMINAR FLOW CONTROL IN THE JIAFS AT NASA LANGLEY RESEARCH CENTER Status Report, 1 Jan. - 30 Jun. 1981
W. Pfenninger 30 Jul. 1981 15 p ref
(Grant NsG-1585)
(NASA-CR-164843) Avail: NTIS HC A02/MF A01 CSCL 01C

At high Reynolds numbers, the performance of a low drag suction LFC airplane is essentially controlled by the induced drag and the turbulent friction drag of the nonlaminarized area. The question then arises as to how the airplane cruise lift to drag ratio (L/D) sub cruise) cruise increases with increasing extent of laminar flow 0 sub lam/0 sub total (0 = airplane wetted area). In particular, the question arises as to the airplane performance in the optimum case with all laminar flow over the airplane wetted area. Design approaches of all laminar flow LFC airplanes which optimize the airplane range R = eta sub ov times (L/D) times H times lambda n(W sub 0/W sub E) are considered. A.R.H.

N81-32124# ARO, Inc., Arnold Air Force Station, Tenn.
STING INTERFERENCE EFFECTS ON THE STATIC DYNAMIC AND BASE PRESSURE MEASUREMENTS OF THE STANDARD DYNAMICS MODEL AIRCRAFT AT MACH NUMBERS 0.3 THROUGH 1.3 Final Report, Jun. - Dec. 1980
Fred B. Cyran AEDC Aug. 1981 66 p refs Sponsored by the AF
(AD-A102612; AEDC-TR-81-3) Avail: NTIS HC A04/MF A01 CSCL 20/4

Wind tunnel tests were conducted in the Arnold Engineering Development Center (AEDC) Propulsion Wind Tunnel Facility (PWT) to provide sting-support interference information for planning and directing wind tunnel tests at subsonic and transonic Mach numbers. Sting length and diameter effects on static and dynamic stability derivatives, static pitching moments, and base pressure of the Standard Dynamics Model (SDM) were investigated at Mach numbers from 0.3 to 1.3. Dynamic stability derivatives were obtained at a nominal frequency of 5.2 Hz, at amplitudes of 1.0, 1.5, and 2.0 deg. Pitch and yaw data were both obtained as a function of angle of attack. Previously unpublished static force and moment data for the SDM are also presented. The results showed that interference related to sting length was most pronounced at Mach number 0.95 for all measurements; the results also showed significant effects at Mach numbers 1.1 and 1.3 for yaw damping. Substantial sting diameter effects were observed at Mach number 0.3 for pitch damping and at Mach number 1.3 for yaw damping. Both sting length and diameter effects were found in base-pressure measurements at most Mach numbers. Author (GRA)

N81-32128# Naval Ship Research and Development Center, Bethesda, Md. Aviation and Surface Effects Dept.
INVESTIGATION OF THE CIRCULATION CONTROL WING/UPPER SURFACE BLOWING HIGH-LIFT SYSTEM ON A LOW ASPECT RATIO SEMISPAN MODEL Final Report, Aug. - Sep. 1980
Michael J. Harris May 1981 85 p refs
(WF41421000)
(AD-A103090; DTNSRDC/ASED-81/10) Avail: NTIS HC A05/MF A01 CSCL 20/4

The results from one in a series of investigations undertaken to develop the Circulation Control Wing/Upper Surface Blowing (CCW/USB) high-lift concept are presented. Included are: isolation of propulsion jet turning, effects of tip devices, and thrust reversing. As evaluated, the concept employs a modified supercritical wing with a 3.6-percent chord circular trailing edge and tangential blowing from a thin, full-span slot over this trailing edge. In addition, turbofans are mounted over the wing so that the exhaust scrubs the upper surface of the wing and is turned by the trailing edge. Unlike other upper surface blowing concepts, thrust deflection is accomplished by entraining the propulsive jet with tangential blowing around the trailing edge. The propulsive-induced lift enhances the proven high lift of the circulation control wing. For a thrust coefficient of 3.76, a tangential blowing coefficient of 0.24, and an angle of attack of 16 deg, the low aspect ratio model produced an untrimmed lift coefficient of 6.5. The system also demonstrated the capability to be used as an effective thrust reverser for deceleration during the landing ground roll. Author (GRA)

N81-32130# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
PROCEDURAL HANDBOOK FOR ESCAPE SYSTEM/ ACCIDENT INVESTIGATION HELMET USAGE ASPECTS, INCLUDING FAILURE ANALYSIS Final Report
Robert Snyder 20 May 1981 21 p
(AD-A102803; NADC-81066-60) Avail: NTIS HC A02/MF A01 CSCL 06/7

Aircrew protective helmets are currently developed to reduce the severity of head impact injuries. Many helmets involved in ejections and land and water crashes may provide clues concerning the sequence of events immediately prior to and/or during the accident. Helmet design may have been a factor in the serious and sometimes fatal injuries sustained during these accidents. This handbook will describe a systematic analysis of aircrewman's helmets involved in accidents or ejections. This analysis may identify and recognize design weaknesses and result in the initiation of appropriate effective remedial action. Author (GRA)

N81-32131# Technische Universitaet, Brunswick (West Germany). Lehrstuhl fuer Flugmechanik.
TAKEOFF AND MISSED APPROACH UNDER THE INFLUENCE OF WIND SHEAR [START UND DURCHSTART UNTER SCHERWINDEINFLUSS]
Reinhard Koenig and Peter Krauspe May 1980 27 p refs In GERMAN
(TUBS/SFB-58-80-05-01) Avail: NTIS HC A03/MF A01

The effect of wind shear on flight performance and flight safety is examined. Loads on aircraft surfaces are quantized. Statutory regulations that concern takeoff and missed approach are considered. The effects of wind shear on takeoff, specifically regarding a missed approach to glide path, are then discussed. Air traffic control measures in consideration of wind shear are proposed. Author (ESA)

N81-32133# Radio Technical Commission for Aeronautics, Washington, D. C.
MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR MICROWAVE LANDING SYSTEM (MLS) AIRBORNE RECEIVING EQUIPMENT
17 Jul. 1981 118 p
(RTCA/DO-177) Avail: NTIS HC A06/MF A01

Describes characteristics, typical applications, and operational goals envisioned for microwave landing systems are described (MLS). Minimum performance standards for the airborne MLS receiving equipment are given. These standards define the required receiver performance under standard and environmental conditions and detail recommended test procedures to ensure compliance. Tests are included where performance cannot be adequately determined by bench tests. J.M.S.

N81-32136# Fondazione Ugo Bordoni, Rome (Italy).
CHARACTERISTICS OF A DIGITAL FILTER FOR A PRECISION DME SYSTEM IN MICROWAVE LANDING SYSTEMS [CARATTERISTICHE DI UN FILTRO DIGITALE APPLICATO AL SISTEMA DME DI PRECISIONE PER MLS]
Franco Vatalaro Sep. 1980 40 p refs In ITALIAN
(FUB-43-1980) Avail: NTIS HC A03/MF A01

The filter is placed onboard the aircraft as a last processing stage before the data are presented to the pilot. The filter is of the type alpha minus beta, used in radar applications. Errors were analyzed, distinguishing three different regions of the power spectrum: path following error; control motion noise; and high frequency noise. The precision requirements for conventional takeoff and vertical takeoff were examined. The parameters of the proposed filter, bandwidth and frequency response are given. Bendix is also described and comparison shows advantages and disadvantages in both designs. Final specifications by international authorities have been published. Author (ESA)

N81-32137*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A FULL-SCALE WIND TUNNEL INVESTIGATION OF A HELICOPTER BEARINGLESS MAIN ROTOR
William Warmbrodt and John L. McCloud, II Aug. 1981 287 p
(NASA-TM-81321; A-8696) Avail: NTIS HC A13/MF A01 CSCL 01C

A helicopter bearingless main rotor was tested. Areas of investigation included aeroelastic stability, aerodynamic performance, and rotor loads as a function of collective pitch setting, RPM, airspeed and shaft angle. The rotor/support system was tested with the wind tunnel balance dampers installed and, subsequently, removed. Modifications to the rotor hub were tested. These included a reduction in the rotor control system stiffness and increased flexbeam structural damping. The primary objective of the test was to determine aeroelastic stability of the fundamental flexbeam/blade chordwise bending mode. The rotor was stable for all conditions. Damping of the rotor chordwise bending mode increases with increased collective pitch angle at constant operating conditions. No significant decrease in rotor damping occured due to frequency coalescence between the blade chordwise fundamental bending mode and the support system. R.C.T.

N81-32138*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLAR POWERED AIRCRAFT Patent Application
William H. Phillips, inventor (to NASA) Filed 15 May 1981 12 p
(NASA-Case-LAR-12615-1; US-Patent-Appl-SN-263829) Avail: NTIS HC A02/MF A01 CSCL 01C

A cruciform wing structure for a solar powered aircraft is described. Solar cells are mounted on horizontal wing surfaces. Wing surfaces with spanwise axis perpendicular to the horizontal surfaces maintain these surfaces normal to the Sun line by allowing the aircraft to be flown in a controlled pattern at a large bank angle. The solar airplane may be of conventional design with respect to fuselage, propeller and tail, or may be constructed around a core and driven by propeller mechanisms attached near the tips of the airfoils. NASA

N81-32140# ARO, Inc., Arnold Air Force Station, Tenn. Directorate of Technology.
CAPTIVE AIRCRAFT TESTING AT HIGH ANGLES OF ATTACK Final Report, Oct. 1976 - Sep. 1978
R. W. Butler and J. P. Christopher AEDC Aug. 1981 42 p refs
(AD-A103108; AEDC-TR-80-60) Avail: NTIS HC A03/MF A01 CSCL 20/4

A captive testing technique capable of simulating aircraft maneuvers at high angles of attack has been developed and tested in the Aerodynamic Tunnel 16T of the Arnold Engineering Development Center (AEDC). The captive technique uses a closed loop system between wind tunnel, model, and computer. Use of the wind tunnel as an analog forcing function eliminates the requirement for a conventional static data matrix in motion simulation. Various high angle-of-attack maneuvers (rudder roll, aileron roll, wind-up turn, etc.) were generated with the captive system and show good correlation with flight data. Author (GRA)

N81-32141# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
TWIN-ROTOR PATROL AIRSHIP FLYING MODEL DESIGN RATIONALE
John A. Eney 1 Jun. 1981 14 p
(AD-A102575; NADC-81165-60) Avail: NTIS HC A02/MF A01 CSCL 01/3

To gain experimental data on the controllability of tilt-rotor airships operating near neutral buoyancy, a 32-foot long 1/10 scale flying model is being developed using two contrarotating tilt-rotor representing those on the NASA/Bell XV-15 research aircraft. It is planned to demonstrate controlled hover and transition in an engine - out condition with one rotor stopped to emphasize the natural attitude stability and damping of such vehicles. Author (GRA)

N81-32142# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
DEVELOPMENT OF AN AIRCRAFT MANEUVER LOAD SPECTRUM BASED ON VGH DATA Final Report
John W. Lincoln Jul. 1980 90 p
(AD-A102750; ASD-TR-80-5037) Avail: NTIS HC A05/MF A01 CSCL 01/3

This report describes a procedure whereby a full scale aircraft maneuver load fatigue spectrum can be developed from recorded VGH data. It is assumed in this development that the internal loads (stresses) at the appropriate control points are available for combinations of velocity, load factor, altitudes and weight so that an interpolation on these points will provide the desired accuracy. The procedure will generate (for a control point) the cumulative probability of exceeding a given stress, exceedances per hour of a given stress level, the probability density function for stress and the stress spectrum. The aircraft spectrum is derived from the assumption that the aircraft test loads derived from a linear combination of balanced loading conditions will provide a good simulation of the stress history at and 'between' the control points. The application of the program to new designs (mission analysis) and to tracking can be made without modification. The computer program for this calculation is included along with a sample problem. As an example of an application of this program, the stress exceedance functions for a control point on the wing of the F-4 are shown that were computed from the VGH data accumulated over a period of one year. Author (GRA)

N81-32143*# Lockheed Engineering and Management Services Co., Inc., Houston, Tex.
SOFTWARE SURVEY FOR THE AVIONICS TEST BED Interim Report
J. M. Cobb Jul. 1981 113 p
(Contract NAS9-15800)
(NASA-CR-161089; JSC-17490; LEMSCO-16941) Avail: NTIS HC A06/MF A01 CSCL 01D

A survey was conducted to itemize software programs that could possibly be used in the development of an avionics test bed for shuttle attached or autonomous large space structures. The results of this survey are presented. Each program is described on a standard form. J.M.S.

N81-32144# Arinc Research Corp., Annapolis, Md.
COST BENEFIT AND FAILURE CRITICALITY ANALYSES OF THE STANDARD AVIONICS INTEGRATED CONTROL SYSTEM (SAICS) CONCEPT
E. Straub, D. Godwin, and A. Savisaar Jun. 1981 129 p
(Contract F04606-79-G-0082; AF Proj. 2257)
(AD-A102197; Rept-2258-02-1-2439) Avail: NTIS HC A07/MF A01 CSCL 09/5

This document reports on the existing individual and integrated avionics cockpit controls of contemporary aircraft. Through failure-criticality and cost-benefit analyses, it examines the potential of a Standard Avionics Integrated Control System (SAICS) as a replacement for existing individual controls. The report provides information on existing individual cockpit avionics control mean times between failures (MTBFs), costs, weights, and sizes. It also provides MTBF, cost, space, and weight estimates for a unique integrated control, a standard avionics integrated control, and a manual back-up control panel for both. The study addresses primarily hardware, not software, and places emphasis on avionics control rather than display. It is assumed that installation of a SAICS would begin in five candidate tactical aircraft some time after 1985. Author (GRA)

N81-32147*# Avco Lycoming Div., Stratford, Conn.
DESIGN AND EVALUATION OF AN INTEGRATED QUIET, CLEAN GENERAL AVIATION TURBOFAN (QCGAT) ENGINE AND AIRCRAFT PROPULSION SYSTEM Contractor Report, Dec. 1976 - Apr. 1980
Jon German, P. Fogel, and C. Wilson Apr. 1980 226 p refs
(Contract NAS3-20584)
(NASA-CR-165185; LYC-80-27) Avail: NTIS HC A11/MF A01 CSCL 21E

The design was based on the LTS-101 engine family for the core engine. A high bypass fan design (BPR = 9.4) was incorporated to provide reduced fuel consumption for the design mission. All acoustic and pollutant emissions goals were achieved. A discussion of the preliminary design of a business jet suitable for the developed propulsion system is included. It is concluded that large engine technology can be successfully applied to small turbofans, and noise or pollutant levels need not be constraints for the design of future small general aviation turbofan engines. T.M.

N81-32150# Tennessee Univ. Space Inst., Tullahoma.
UNSTEADY SWIRLING FLOWS IN GAS TURBINES Annual Technical Report, 1 Apr. 1980 - 30 Jun. 1981
M. Kurosaka Jun. 1981 51 p
(Contract F49620-78-C-0045; AF Proj. 2307)
(AD-A102852; AFOSR-81-0608TR) Avail: NTIS HC A04/MF A01 CSCL 21/5

This annual report covers the second phase of investigations into the unsteady swirling flows. The overall objective of the entire program is to acquire fundamental understanding of a phenomenon characterized by violent fluctuations occurring in swirling flows in gas turbines; this flow instability, dubbed here as 'Vortex Whistle' is known to be capable of causing severe fatigue failure in gas turbine components. Although the phenomena of 'Vortex Whistle' have never remained unrecognized, perhaps for the reason that they appeared in seemingly unrelated incidents under various disguise, no comprehensive investigation appears to have been embarked upon. In addition, in spite of the fact that the vortex whistle is a pure tone noise and distinctly audible, its role as a source of aircraft engine noise has never been recognized. Furthermore, when the vortex whistle becomes intense, it induces a change in the steady flow field, the total temperature being spontaneously separated in the radial direction (the Ranque-Hilsch effect). Not only its implications to the study aero design of turbomachines are of obvious importance, but also this appears to offer an unmistakable clue to the puzzling Ranque-Hilsch effect. GRA

N81-32151*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FLIGHT EVALUATION OF THE STOL FLARE AND LANDING DURING NIGHT OPERATIONS
James A. Franklin, Robert C. Innis, and Gordon H. Hardy Aug. 1981 46 p refs
(NASA-TM-81312; A-8704) Avail: NTIS HC A03/MF A01 CSCL 01C

Simulated instrument approaches were made to Category 1 minimums followed by a visual landing on a 100 x 1700 ft STOL runway. Data were obtained for variations in the aircraft's flare response characteristics and control techniques and for different combinations of aircraft and runway lighting and a visual approach slope indication. With the complete aircraft and runway lighting and visual guidance no degradation in flying qualities or landing performance was observed compared to daylight operations. elimination of the touchdown zone floodlights or the aircraft landing lights led to somewhat greater pilot workload; however, the landing could still be accomplished successfully. Loss of both touchdown zone and aircraft landing lights led to a high workload situation and only a marginally adequate to inadequate landing capability. T.M.

N81-32152# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
THE CONTROL ANTICIPATION PARAMETER FOR AUGMENTED AIRCRAFT Final Report, 1 Jan. - 15 May 1981
D. E. Bischoff 15 May 1981 40 p refs
(AD-A102626; NADC-81186-60) Avail: NTIS HC A03/MF A01 CSCL 01/3

A longitudinal control anticipation parameter is developed which correlates high order augmented aircraft dynamics with both lower order equivalent system descriptions and pilot opinion ratings. Three extensive in-flight research programs are analyzed via the developed parameter in an effort to define regions of pilot acceptability. Additional effort is recommended to verify the minimum level 1 boundaries and to determine the relationship between the control anticipation parameter and alternate proposed criteria. Author (GRA)

N81-32153*# National Aeronautics and Space Administration, Washington, D. C.
WIND TUNNELS OF NASA
Donald D. Baals and William R. Corliss 1981 162 p Original document contains color illustrations
(NASA-SP-440) Avail: NTIS HC A08/MF A01 CSCL 14B

The contribution of wind tunnels to aerodynamic studies is described. The development of the wind tunnel and the problems of calibration, scaling, and instrumentation are discussed. The NASA wind tunnels form the basis for the book, but Air Force, university, and industrial facilities are also considered. T.M.

N81-32154*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.
TWO-DIMENSIONAL DYNAMIC STALL AS SIMULATED IN A VARYING FREESTREAM
G. Alvin Pierce, Donald L. Kunz, and John B. Malone 1978 67 p refs
(Grant NGR-11-002-185)
(NASA-CR-164829) Avail: NTIS HC A04/MF A01 CSCL 14B

A low speed wind tunnel equipped with a axial gust generator to simulate the aerodynamic environment of a helicopter rotor was used to study the dynamic stall of a pitching blade in an effort to ascertain to what extent harmonic velocity perturbations in the freestream affect dynamic stall. The aerodynamic moment on a two dimensional, pitching blade model in both constant and pulsating airstream was measured. An operational analog computer was used to perform on-line data reduction and plots of moment versus angle of attack and work done by the moment were obtained. The data taken in the varying freestream were then compared to constant freestream data and to the results of two analytical methods. These comparisons show that the velocity perturbations have a significant effect on the pitching moment which can not be consistently predicted by the analytical methods, but had no drastic effect on the blade stability. A.R.H.

N81-32155# ARO, Inc., Arnold Air Force Station, Tenn.
SUPPLEMENTAL CALIBRATION OF THE AEDC-PWT 16 FT TRANSONIC TUNNEL AERODYNAMIC TEST SECTION Final Report, Dec. 1979 - Jun. 1980
M. L. Mills AEDC Jul. 1981 109 p refs Sponsored by the AF
(AD-A102384; AEDC-TR-80-32) Avail: NTIS HC A06/MF A01 CSCL 14/2

A test was conducted in the Propulsion Wind Tunnel (16T) to: (1) define the effect of plenum suction utilization on the tunnel calibration and power consumption at free-stream Mach numbers less than 0.75, (2) improve the centerline Mach number calibration at supersonic Mach numbers, (3) correlate the test section centerline Mach number with the tunnel nozzle Mach number, and (4) investigate the effect of tunnel humidity on the calibration. Data were acquired for Mach numbers from 0.6 to 1.6 at total pressures from 400 to 3,200 psfa. The calibration was conducted in the aerodynamic test section using a centerline pipe and wall pressure orifices to define the Mach number distributions. The results of an evaluation of alternate methods of calibration indicated that the current method is the most acceptable. Slightly changing the tunnel nozzle to eliminate the disturbances in the flow at supersonic Mach numbers indicated the need to investigate the entire nozzle system. Comparison of this calibration with previous calibration results indicates that a revision of the current tunnel calibration is not necessary.
Author (GRA)

N81-32156# Naval Civil Engineering Lab., Port Hueneme, Calif.
LIME-STABILIZED NATIVE SOIL AS BASE COURSE FOR LIGHT AIRCRAFT PAVEMENT Final Report, Feb. 1978 - Apr. 1981
Robert B. Brownie Apr. 1981 130 p refs
(Contract DOT-FA78WAI-834)
(AD-A102196; FAA-RD-80-112) Avail: NTIS HC A07/MF A01 CSCL 13/2

Present Federal Aviation Administration policy does not recommend the use of lime stabilized soil as base course for airport pavements. The potential savings in cost and materials by using this type of construction for light duty airport pavements (aircraft gross weights less than 30,000 lbs) led to the use of lime stabilized native soil in place of other base course materials at three airports in the Southwestern United States. Those airports are located at Chino, California, Big Bear Lake, California, and Payson, Arizona. The compositions of those base courses were determined by laboratory analyses of core borings and soil samples. Visual condition surveys were performed, and surface deflections under load were measured. Climatological data and aircraft traffic histories were obtained. All of those factors and the performance of the pavements were analyzed, and a suggested specification was prepared for constructing lime stabilized base courses. GRA

N81-32158# Pacer Systems, Inc., Arlington, Va.
DEVELOPMENT OF A HELIPORT CLASSIFICATION METHOD AND AN ANALYSIS OF HELIPORT REAL ESTATE AND AIRSPACE REQUIREMENTS Final Report, Jan. - Jun. 1981
F. D. Smith and A. G. DeLucien Jun. 1981 100 p refs
(Contract DOT-FA01-80-C-10080)
(AD-A102521; PAR-018-81; FAA-RD-81-35) Avail: NTIS HC A05/MF A01 CSCL 01/5

A helicopter performance related heliport classification method is developed which accommodates an applicable range of operating conditions and factors which impact helicopter performance. Dimensional values for use in planning both real estate and airspace surfaces are determined for application to the identified heliport classifications. Those values are incorporated into generalized guidelines for heliport planners to meet site-specific and non-standard operational conditions. Requirements for flight manual performance charts and published heliport information are also identified. Author (GRA)

N81-32164# National Aerospace Lab., Amsterdam (Netherlands). Flight Div.
DATA ACQUISITION AND ANALYSIS SYSTEM AS A TRAINING DEVICE FOR SIMULATED CONVENTIONAL WEAPON DELIVERY
C. F. G. M. Hofman and J. Batenburg (Royal Netherlands Air Force) 24 Jun. 1980 13 p refs Presented at AGARD Symp. on Subsystem Testing and Flight Test Instr., Geilo, Norway, 27-30 Oct. 1980 and at 2nd Interserv./Ind. Training Equipment Conf., Salt Lake City, 18-20 Nov. 1980
(NLR-MP-80027-U) Avail: NTIS HC A02/MF A01

The system, based on a photogrammetric method, yields release conditions, the nominal weapon impact position and the weapon time of flight. Simulated attacks on a great variety of realistic targets can be evaluated and validated as there is no need to drop training weapons. No ground-based instrumentation in the target area is needed. The system consisting of an airborne data acquisition system installed in the aircraft and a ground-based processing and analysis system at the airbase allows a debriefing of the pilot within half an hour after completion of the mission. Circular error probable during flight tests with a variety of weapons compared well with predictions. Airworthiness evaluations shows the equipment to be reliable and having no adverse effect on handling. Author (ESA)

N81-32273# Brookhaven National Lab., Upton, N. Y.
WATER-COMPATIBLE POLYMER CONCRETE MATERIALS FOR USE IN RAPID REPAIR SYSTEMS FOR AIRPORT RUNWAYS Final Report
T. Sugama, L. E. Kukacka, and W. Horn Mar. 1981 129 p refs
(Grant AFOSR ISSA 80-00027; AF Proj. 2307)
(AD-A102873; BNL-51390; AFOSR-81-0589TR) Avail: NTIS HC A07/MF A01 CSCL 01/5

Water-compatible polymer concrete (PC) formulations have been developed which appear to have potential for use in all-weather rapid repair procedures for bomb-damaged runways. Formulations consisting of furfuryl alcohol, water-saturated aggregate, dry silica flour, promoters, and catalysts produced composites with properties suitable for repair purposes when mixed and polymerized at temperatures from -20 to 30 C. Calcium-unsaturated polyester complexed PC also produced excellent properties. However, the early strength criteria, (2000 psi (13.78 MPa) at 1 hr) and other requirements such as compatibility of the formulation with water and practical working times could be attained only at temperatures >20 deg C. This system can be polymerized under water. Studies of the polymerization reaction mechanisms, materials properties, costs, and potential placement methods were performed. Author (GRA)

N81-32290# Energy and Minerals Research Co., Exton, Pa.
ULTRASONIC DISPERSION OF PARTICULATE HIGH DENSITY FUELS Final Report, Sep. 1979 - Sep. 1980
Wright-Patterson AFB, Ohio AFWAL May 1981 44 p
(Contract F33615-79-C-2090; AF Proj. 3048)
(AD-A102771; AFWAL-TR-81-2033) Avail: NTIS HC A03/MF A01 CSCL 21/4

The high energy-density slurry fuels being developed to increase missile range may present settling and gelation problems in use. This project was performed to demonstrate ultrasonic dispersion techniques, with the goal of deagglomerating to more uniform, smaller particle-size solids distribution and increased storage stability. Batch and continuous process laboratory-type arrays were used at various power levels (nominal 200 to 1000 watts), on carbon and boron/JP-10 slurries of interest to the Air Force. Analytical techniques, difficult with the particulate sizes involved (down to the 300-millimicron range), showed some measure of ultrasonic deagglomeration, which increased with increasing ultrasonic energy densities, and complete stability of the 60-day-storage activated samples, in contrast to the non-activated control samples. Extended analysis might better quantify ultrasonic effect, but combustion tests could directly identify performance benefits. GRA

N81-32522# Sacramento Air Materiel Area, McClellan AFB, Calif.

THE USE OF ACOUSTIC EMISSION FOR DETECTION OF ACTIVE CORROSION AND DEGRADED ADHESIVE BONDING IN AIRCRAFT STRUCTURE

John Rodgers and Steven Moore Nov. 1975 16 p refs
(AD-A102923; Paper-14) Avail: NTIS HC A02/MF A01 CSCL 01/3

Procedures have been developed by engineers at Sacramento Air Logistics Center to detect active corrosion in aluminum structure and moisture-degraded adhesive bonding in composite honeycomb using acoustic emission monitoring. Simple heating methods employing a hot air gun or heat lamp are used to increase emission from active corrosion sources, and to create the stresses necessary to break moisture-degraded adhesive bonds. Corrosion detection in aluminum skin and honeycomb core has proven very successful. Detection of moisture-degraded bonding between aluminum skin and phenolic core on the F-111 vertical stabilizer leading edge has been substantially improved and simplified. Acoustic emission is replacing X-ray and ultrasonic inspection procedures in these applications, with direct benefits realized in a 75% reduction of inspection time and costs, fewer work flow interruptions, and better defect area definition.
Author (GRA)

N81-32956*# California Univ., Los Angeles. School of Engineering and Applied Science

FORECAST OF FUTURE AVIATION FUELS: THE MODEL Final Report

M. B. Ayati, C. Y. Liu, and J. M. English Sep. 1981 192 p refs
(Contract NsG-3116)
(NASA-CR-165486; UCLA-eng-8037) Avail: NTIS HC A09/MF A01 CSCL 12B

A conceptual models of the commercial air transportation industry is developed which can be used to predict trends in economics, demand, and consumption. The methodology is based on digraph theory, which considers the interaction of variables and propagation of changes. Air transportation economics are treated by examination of major variables, their relationships, historic trends, and calculation of regression coefficients. A description of the modeling technique and a compilation of historic airline industry statistics used to determine interaction coefficients are included. Results of model validations show negligible difference between actual and projected values over the twenty-eight year period of 1959 to 1976. A limited application of the method presents forecasts of air transportation industry demand, growth, revenue, costs, and fuel consumption to 2020 for two scenarios of future economic growth and energy consumption.
Author

N81-32966*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

USER'S MANUAL FOR A COMPUTER PROGRAM TO CALCULATE DISCRETE FREQUENCY NOISE OF CONVENTIONAL AND ADVANCED PROPELLERS

R. M. Martin and F. Farassat Aug. 1981 90 p refs
(NASA-TM-83135; L-14374) Avail: NTIS HC A05/MF A01 CSCL 20A

A user's manual is presented for a computer program for the calculation of discrete frequency noise of conventional and advanced propellers. The structure of the program and the subroutines describing the input functions are discussed. Input variables and their default values and the variables in the output data sheet are defined. Two versions of the program are available. These differ only in the graphic output capability. One version has only printed output capability. A second version with extensive graphic output capability is available for the computer system at Langley. This Manual includes four detailed examples of both the printed and graphic outputs. These examples may be reproduced by users to check their code on their computer system.
A.R.H.

N81-33131# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugmechanik.

DESIGN OF OPTIMAL INPUTS FOR THE IDENTIFICATION OF CHARACTERISTICS OF AIRCRAFT FLIGHTS [ENTWURF VON EINGANGSSSIGNALEN FUER DIE KENNWERTERMITTLUNG BEI FLUGZEUGEN]

E. Plaetschke *In* Hochschule der Bundeswehr Seminar on the Simulation and Optimization of Dyn. Systems Jun. 1981 p 102-120 refs
Avail: NTIS HC A08/MF A01

The design of optimal inputs for identifying stability and control derivatives of the longitudinal and lateral motion of an aircraft are considered. Two different procedures of input design were treated in more detail. Starting with investigations in the frequency domain, the first method yields a multistep input signal, which fulfils specific spectral requirements. Compared with the power spectral densities of the commonly used double and single step input, this multistep input has a larger bandwidth. The second method is based on the optimization of different measures of the Fisher information matrix, such as determinant or trace. Depending on the measure used, the designed signals differ with respect to their spectral composition. The discussed input signals, which were used in a flight test program, are compared with respect to the achieved accuracy of the identified stability and control derivatives.
Author (ESA)

N81-33132# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugmechanik.

SYSTEM IDENTIFICATION FOR CONTROLLED AIRCRAFT [SYSTEMIDENTIFIZIERUNG AM GEREGELTEN FLUGZEUG]

M. Marchand *In* Hochschule der Bundeswehr Seminar on the Simulation and Optimization of Dyn. Systems Jun. 1981 p 121-166 refs In GERMAN

Avail: NTIS HC A08/MF A01

The problems and experiences in applying a maximum likelihood identification method to the flight test data of a controller-supported aircraft are reported. The effect of the controller on the identifiability of the parameters and the validity of the model structure of a so-called equivalent system are treated. The role of the pilot in the control loop, e.g., with respect to stability, and the identification of pilot models is addressed.
Author (ESA)

N81-33133# RAND Corp., Santa Monica, Calif.

ESTIMATING AIRCRAFT DEPOT MAINTENANCE COSTS Interim Report

Kenneth E. Marks and Ronald W. Hess Jul. 1981 214 p
(Contract MDA903-77-C-0107)
(AD-A103623; RAND/R-2731-PA/E) Avail: NTIS HC A10/MF A01 CSCL 05/1

This report describes a series of parametric equations for use in estimating the depot maintenance cost of new Air Force aircraft, particularly for the five major maintenance categories: airframe rework, engine overhaul, airframe component repair, engine component and accessory repair, and avionics component repair. The equations are intended to provide cost estimates for Defense Systems Acquisitions Review Council Milestone II, at which point some design details of major aircraft subsystems (airframes, engine avionics) are available. The report presents a single set of equations that are the most representative and applicable to the widest range of estimating situations, but presents alternative equations and supporting data and analyses.
Author (GRA)

N81-33134# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A STUDY OF THE FACTORS AFFECTING PRODUCTIVITY AT THE NAVAL AIR REWORK FACILITIES M.S. Thesis

Janice Allton and Stephen N. Bernard Jun. 1981 83 p refs
(AD-A103783; AFIT-LSSR-10-81) Avail: NTIS HC A05/MF A01 CSCL 05/1

The purpose of this study was to determine the factors affecting productivity at Naval Air Rework Facilities (NARFs). Specific points addressed were number and identity of factors, internal consistency and usefulness in predicting perceived productivity. A seventy-two item questionnaire was administered to a random sample of NARF production-line employees. Five hundred thirty-four cases were factor analyzed. Eleven factors extracted were discussed. Eight of these were used to develop a linear multiple regression model to predict perceived productivity. Approximately twenty percent of the variance in perceived productivity was predicted, with five independent variables (factors) work scheduling supervision, overtime, training quality and equipment. These factors generally substantiated those found in current literature.
Author (GRA)

N81-33135# Air Force Inst. of Tech., Wright-Patterson AFB Ohio. School of Systems and Logistics.
A PRESCRIPTIVE MODEL FOR RESOURCE ALLOCATION AT THE INTERMEDIATE LEVEL ENGINE FACILITY M.S. Thesis
Edward Connolly and Charlie D. Johnson Jun. 1981 91 p refs
(AD-A103785; AFIT-LSSR-26-81) Avail: NTIS HC A05/MF A01 CSCL 15/5

Inability to support spare engine requirements has a critical impact on this nation's ability to meet its worldwide commitments during a crisis. This study examined those factors that significantly affect the intermediate level Propulsion Branch's ability to provide a steady supply of spare engines. Through simulation modeling and analysis, four factors were identified as driving the Base Repair Cycle time: spare parts, repair equipment, manpower, and experience level. A decision support system was developed which enables most users to assess the influence on repair cycle time of additional funding levels in specific factor areas.
Author (GRA)

N81-33136# Boeing Aerospace Co., Seattle, Wash. Product Support/Experience Analysis Center.
DEVELOPMENT OF MAINTENANCE METRICS TO FORECAST RESOURCE DEMANDS OF WEAPON SYSTEMS Final Report, 1 Mar. 1978 - 1 Oct. 1980
Donald K. Hindes, Gary A. Walker, and David H. Wilson Wright-Patterson AFB, Ohio Air Force Human Resources Lab. Oct. 1980 154 p refs
(Contract F33615-77-C-0075)
(AD-A104089; D194-10089-5) Avail: NTIS HC A08/MF A01 CSCL 05/1

This report describes the methodology and results of a 32 month effort to 'Develop Maintenance Metrics To Forecast Resource Demands of Weapon Systems'. Increased concern with the rising cost to support weapon systems currently in operation, as well as those in development, has created the need for more accurate methods of projecting maintenance requirements. The objective of this subject research was to alleviate the above need by identifying, determining, and integrating those measurable weapon system parameters which are necessary and sufficient to predict and quantify the drivers of maintenance resource demands. Phase 1 investigated and developed new maintenance metrics for aircraft propulsion and avionics. Phase 1 results were then reviewed for overall success and applicability before proceeding with Phase 2 efforts. Initial results were acceptable so Phase 2 of the study was initiated to develop metrics for the rest of the subsystems commonly included in Air Force aircraft. This document is the final report of a series of five technical reports published during the study. It is intended to be a summary overview of the study project and an application guide for potential users of the developed metrics methodology. Study findings include: (1) Review of published literature; (2) Critical equipment selection; (3) Maintenance impact parameter identification; (4) Data base assembly and integration; (5) Maintenance impact estimating relationship detection and analysis; (6) Maintenance metric model development; and (7) Maintenance metrics validation. GRA

N81-33137# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE IMPACT OF MILITARY APPLICATIONS ON ROTORCRAFT AND V/STOL AIRCRAFT DESIGN
Jun. 1981 264 p refs In ENGLISH and FRENCH Conf. held at Paris, 6-9 Apr. 1981
(AGARD-CP-313; ISBN-92-835-0294-9) Avail: NTIS HC A12/MF A01

The technological status of rotorcraft and V/STOL aircraft were reviewed in light of operational possibilities and needs. Topics include operational experiences, present status of technology, future trends, and military mission effectiveness.

N81-33138# French Army, Villacoublay-Air (France).
INCIDENTS OF PROBLEMS IN SETTING TO WORK ON THE CONCEPTUAL DESIGN OF HELICOPTERS [INCIDENCES DES PROBLEMES DE MISE EN OEUVRE SUR LA CONCEPTION DES HELICOPTERES]
M. G. Cannet *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 12 p In FRENCH
Avail: NTIS HC A12/MF A01

The problems focused on concern only the development and design of military helicopters. The general operational requirements of today's military helicopter were reviewed. The immediate problems facing the helicopter industry are discussed. Technological forecasts for the next 20 years are presented with emphasis on the direction that research management will take in helicopter design. T.M.

N81-33139# Martin Marietta Aerospace, Bethesda, Md.
VERTICAL LIFT CAPABILITIES FOR THE 80'S AND 90'S
Norman R. Augustine and James B. Morrison *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 16 p
Avail: NTIS HC A12/MF A01

During the past few years, several things have happened to make vertical lift more attractive. The first is that the technologies in engines, structures, stability and control and avionics have all been improving rapidly, producing great strides in performance, maintainability and potential cost reduction. The second is that the facts of operational life have changed to put additional value on vertical takeoff and landing capability. The status of battlefield vertical lift systems in the United States in reference to the level of technology, mission capabilities and associated development activities is reported. Also, projections in each of these areas are presented, accompanied by a list of recommendations based on the perceived pitfalls in the past and the technological and mission opportunities of the future. T.M.

N81-33140# Marine Corps, Washington, D. C.
TEN YEARS OF US MARINE CORPS HARRIER OPERATIONS
R. A. Gustafson *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 p 10

Avail: NTIS HC A12/MF A01

The VSTOL concept is exceptionally attractive to the Marine Corps because of the significant benefits to expeditionary capability and reduced close air support response times made possible through basing flexibility. The AV-8A was employed world-wide by the Marine Corps aboard ship and ashore. Although the primary purpose of the AV-8A is to provide close air support to the Marine ground combat element, the thrust-vectoring design of the Harrier proved to have significant potential in air combat maneuvering. Operations with the AV-8A highlight areas where future VSTOLs should be improved as well as providing an experience base to support their design. This operational experience proves the VSTOL concept, and the Marine Corps is convinced that significantly increased combat effectiveness is provided. To further expand the VSTOL application, the Marine Corps plans to replace its present eight light attack squadrons with an improved Harrier, the AV-8B. The long term goal is to achieve an all VSTOL aviation force. T.M.

N81-33141# Army Aviation Center, Fort Rucker, Ala.
FIELDING OF AN ADVANCED HELICOPTER. THE UH-60A BLACK HAWK: INITIAL OPERATIONAL EXPERIENCE
Cornelius F. McGillicuddy, Jr. *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 10 p
Avail: NTIS HC A12/MF A01

The Sikorsky UH-60A was developed and designed to replace the UH-1H Iroquois for assault, air cavalry, and aeromedical evacuation missions. The UH-60A carries the infantry squad of 11 men and their equipment as a basic load. Particular emphasis during development was devoted to reducing vulnerability, improving crashworthiness and maintainability. There are eight separate kits for the basic aircraft which increase mission flexibility. The development of the UH-60A was highly successful as have the initial operational experiences. The Black Hawk was issued to operational units and these units deployed and engaged in field exercises both in and outside of the United States. The lessons derived from these operational experiences will assist in improving the UH-60A and defining roles for future utility aircraft. T.M.

N81-33142# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Flight Dynamics Lab.
VIEWS ON V/STOL TACTICAL FIGHTER AIRCRAFT: TECHNOLOGY NEEDS AND RELATIONSHIPS TO THE RUNWAY DENIAL PROBLEMS

John M. Byrnes, G. Keith Richey, and Randall B. Lowry *In* AGARD The Impact of Mil. App. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 13 p refs

Avail: NTIS HC A12/MF A01

On the basis of a number of studies conducted over the past three or four years, the Air Force technology community developed an intense concern over the vulnerability of USAF airbases, particularly those in Central Europe. For this reason, advanced concepts which may help solve the problem in the near and far terms are addressed. A possible airbase survivability plan is presented, and the pros and cons of STOL versus V/STOL aircraft, as a far term solution, are discussed. T.M.

N81-33143*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

HISTORICAL OVERVIEW OF V/STOL AIRCRAFT TECHNOLOGY

Seth B. Anderson *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 13 p

Avail: NTIS HC A12/MF A01 CSCL 01B

During the past 25 years over 60 V/STOL types were studied and flown with varying degrees of success. The requirements for satisfactory characteristics in several key technology areas are discussed and a review is made of various V/STOL aircraft for the purpose of assessing the success or failure of each design in meeting design requirements. This survey shows that in spite of many problems revealed, special operating techniques were developed to help circumvent deficiencies. For the most part performance and handling qualities limitations restricted operational evaluations. Flight operations emphasized the need for good STOL performance, good handling qualities, and stability and control augmentation. The majority of aircraft suffered adverse ground effects. T.M.

N81-33144*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

RECENT PROGRESS IN V/STOL AIRCRAFT TECHNOLOGY

L. Roberts, W. Deckert, and D. Hickey *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 10 p refs

Avail: NTIS HC A12/MF A01 CSCL 01B

Recent results from wind-tunnel and flight-tests investigations for V/STOL aircraft were reviewed. Primary emphasis is given to technical results relating to three types of subsonic aircraft: a quiet STOL aircraft, a tilt rotor aircraft, and a turbofan V/STOL aircraft. Comparison and correlation between theoretical and experimental results, and between wind-tunnel and flight-test results, is made. The quiet STOL aircraft technology results are primarily those derived from the NASA/Boeing Quiet Short Haul Aircraft (QSRA) program. The tilt rotor aircraft technology results are those obtained from the NASA/Army/Navy/Bell (XV-15-TRRA) aircraft flight investigations. The turbofan V/STOL aircraft technology results are from static ground facility and wind-tunnel investigations of a NASA/Navy/Grumman full-scale lift/cruise fan aircraft model, which features two tilting nacelles with TF-34 engines. T.M.

N81-33145# Messerschmidt-Boelkow G.m.b.H., Munich (West Germany). Helicopter Div.

CONTROLS AND DISPLAYS FOR ALL-WEATHER OPERATION OF HELICOPTERS

R. D. vonReth *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 15 p refs

Avail: NTIS HC A12/MF A01

Various mission requirements for all weather operations were reviewed. In particular some of the most important features for military applications are outlined. Some of the basic relations between increasing display sophistication and increasing control sophistication are discussed. Also the influence of various functions on the degree of control automation as it seems desirable for future systems under the aspect of man-machine interaction are taken into consideration. In a comparison the controls and displays arrangement of some representative helicopters of presently operational helicopters are described. An outline of the goals and results of some experimental and research programs is given. The characteristics of presently operational helicopters are compared with the technologically feasible solutions taking into account some of the economic constraints as initial cost, operational cost and reliability. Future basic requirements for the controls and the displays operation are established. T.M.

N81-33146# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THE ROLE OF THE RESEARCH SIMULATOR IN THE SYSTEMS DEVELOPMENT OF ROTORCRAFT

Irving C. Statler and Arlin Deel *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 21 p refs Prepared in cooperation with Army Aviation Research and Development Command, Moffett Field, Calif.

Avail: NTIS HC A12/MF A01 CSCL 14B

Over the last 20 years, flight simulators became widely accepted as training tools. Moreover, research simulators were used extensively by the fixed-wing industry: in the design, testing, and certification of new aircraft. The rotorcraft industry, however, was slow to use man-in-the-loop simulation to solve its design problems, primarily because of the difficulty of modeling complex rotorcraft for realtime simulation and because of the need for a wide-angle visual system for low-level flight. A joint U.S. Army and NASA program was initiated to provide this simulation capability for exploitation by both government and industry. The potential application of the research simulator to future rotorcraft systems design, development, product improvement evaluations, and safety analysis is discussed. T.M.

N81-33147# Societe Nationale Industrielle Aerospatiale, Marignane (France.)

APPLICATIONS OF COMPOSITE MATERIALS FOR THE CONSTRUCTION OF MILITARY HELICOPTERS [APPLICATIONS DES MATERIAUX COMPOSITES POUR LA CONSTRUCTION D'HELICOPTERES MILITAIRES]

A. Sourdon and G. Beziac *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 21 p refs In FRENCH

Avail: NTIS HC A12/MF A01

Production costs and versatility of the construction materials are the guiding factors for aircraft construction techniques. The ever increasing use of composite materials in aircraft construction is a result of these factors. The utilization of composite materials in helicopter construction is discussed. Special emphasis is placed on the advantages and disadvantages of the use of these materials for military helicopters. T.M.

N81-33148# Institut fuer Flugmechanik, Brunswick (West Germany).

THE IMPACT OF HELICOPTER FLIGHT MECHANICS ON MISSION PERFORMANCE

B. L. Gmelin and H.-J. Pausder *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 14 p refs

Avail: NTIS HC A12/MF A01

In comparison to other VTOL aircraft, the helicopter has inherently superior flying characteristics at hover and in the low speed region but it has clear disadvantages by its lower high speed capability. For the completion of today's military helicopter missions near the ground and in all weather flight conditions a careful flight mechanical adaptation of the pilot-helicopter system to the specific task is required. This includes the combined optimization of the basic aircraft, the additional system equipment, and in a certain degree the pilot control behavior. A DFVLR-methodology is presented, having the objective to evaluate the flight mechanical characteristics of the pilot-helicopter system with regard to specific flight tasks. The method leads to taskoriented evaluation diagrams which include scales for the overall system task performance and for the demands on the pilot. Relevant flight test results of the BO 105 helicopter in hover and NOE-flight are presented. Especially the parameters control activity and task performance are discussed. Author

N81-33149# Rolls-Royce Ltd., Bristol (England).

MULTI-MISSION STOVL WITH VECTORED THRUST ENGINES

W. J. Lewis and P. Simplin (Rolls-Royce Ltd., Derby, England) *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 9 p

Avail: NTIS HC A12/MF A01

It is demonstrated how a single vectored thrust engine with plenum chamber burning on the front nozzles can be used in both a subsonic strike and a supersonic air superiority aircraft. The operational capability of the STOVL aircraft was compared with CTOL aircraft powered by an advanced turbofan of similar technology. It is also demonstrated that, when operated on the European environment, the STOVL aircraft when sized and operated in a manner which takes advantage of their specialized capabilities, have higher levels of mission effectiveness compared to the CTOL designs. Author

N81-33150# Textron Bell Helicopter, Fort Worth, Tex. Tilt Rotors.

MISSION POTENTIAL OF DERIVATIVES OF THE XV-15 TILT ROTOR RESEARCH AIRCRAFT

Kenneth G. Wernicke *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun 1981 9 p

Avail: NTIS HC A12/MF A01

Outstanding low- and high-speed performance and flight characteristics were demonstrated and measured on the XV-15 tilt rotor research aircraft. Although the XV-15 was designed specifically as a research vehicle, it has the potential, with suitable modifications, to evolve into a productive aircraft for other missions. An increase in blade chord and installation of current state-of-the-art engines increase payload and significantly reduce fuel consumption. A third engine is installed on top of the fuselage to provide good one-engine-inoperative performance. A new fuselage is used for gunship missions. Derivative aircraft and the required changes for commerical and military applications are described. It is shown that the XV-15 derivatives are competitive with existing aircraft. Some of the derivative aircraft can perform missions not possible with airplanes or helicopters by use of the unique high-speed/long-range VTOL capability and the highly-flexible flight envelope of the tilt rotor aircraft. Author

N81-33151# Sikorsky Aircraft, Stratford, Conn.

ADVANCING BLADE CONCEPT HELICOPTER MISSION CAPABILITIES

Robert Zincone and Arthur W. Linden *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 16 p

Avail: NTIS HC A12/MF A01

Today there are several ongoing research programs aimed at combining speed with helicopter attributes in a single vehicle. There is a growing recognition of a need for such aircraft and an active reexamination of the value of speed, the value of helicopter attributes (hover and low speed performance) and the trade-offs between these. Key attributes of interest to military users are: Battlefield survivability - ballistic, acoustic, radar cross section, IR signature; high speed flight while preserving low speed handling qualities equal to those of modern combat helicopters; compact design with low inertia, yielding high angular rates and precise control in all axes; high acceleration and deceleration capability; carrier and small ship compatibility, with good, low speed platform stability; superior one engine inoperative performance and safety; and field level maintainability with rugged reliability and maintainability attributes owing to simplicity of design. The Advancing Blade Concept helicopter has recently completed a feasibility demonstration phase showing that these attributes can be achieved in future aircraft designs. Author

N81-33152# De Havilland Aircraft Co. of Canada Ltd., Downsview (Ontario).

V/STOL AIRCRAFT TECHNOLOGY IN CANADA

D. C. Whittley *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 9 p refs

Avail: NTIS HC A12/MF A01

Some principles being applied to research in relation to advanced STOL and V/STOL concepts are described. In particular, consideration is given to the supercritical augmentor flap configuration and to a fuselage ejector-lift VTOL concept. L.F.M.

N81-33153# Societe Nationale Industrielle Aerospatiale, Marignane (France.)

THE CONSEQUENCES OF CERTAIN OPERATIONAL REQUIREMENTS ON THE CONCEPTUAL DESIGN OF COMBAT HELICOPTERS [LES CONSEQUENCES DE CERTAINES EXIGENCES OPERATIONNELLES SUR LA CONCEPTION DES HELICOPTERES DE COMBAT]

Jean-Pierre Dubreuil *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 10 p In FRENCH

Avail: NTIS HC A12/MF A01

Three areas of helicopter design were examined: helicopter performance engineering; operational requirements for combat; and instrumentation. Helicopter performance is discussed in terms of controllability and flight speed. Operational characteristics include detectability, vulnerability, and survivability. The avionics are addressed in terms of man machine systems and display devices. T.M.

N81-33154# Costruzioni Aeronautiche Giovanni Agusta S.p.A., Varese (Italy).

DESIGN FOR MAXIMUM EFFECTIVENESS IN THE NAVY ROLE

Paolo Bellavita *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 20 p

Avail: NTIS HC A12/MF A01

The tremendous increase of the submarine threat in terms of speed, depth and weapon systems has forced the navies to review the concepts followed until today for the anti submarine warfare (ASW). Particularly for the peculiar Mediterraneum environment new operational requirements for typical helicopter ASW missions must be developed taking also into account the future availability of low frequency, high range Sonar. To get the maximum profit from this technological improvement, missions should be planned with unusual long time in the search area both in terms of longer hovering and longer Time on Station many miles from the home ship in connection with high air temperature, wind absence, high rotor thrust margin and complete fly away capability in case of engine failure during sonar operation. The optimization of the helicopter design parameters to achieve the maximum effectiveness in the ASW role within the Italian Scenario and the engineering parametric techniques used are described. Author

N81-33155# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany)

THE IMPACT OF OPERATIONAL REQUIREMENTS ON THE COMPROMISE OF DESIRED FEATURES IN ROTORCRAFT DESIGN

Klaus F. M. Schymanietz *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 17 p refs

Avail: NTIS HC A12/MF A01

The increase of influence for helicopters in military missions can be related to more diversification as well as special designed types. General valid aspects include the all-weather capability, high performance and agility, low vulnerability and detectability and all together high mission effectiveness. The addressed systems can be divided in three areas, the design of the dynamic systems including the rotor- and propulsion-system, the structural design, and the design of the equipment systems. In the first area, the dynamic systems and components, the general, i.e., civil and military, trend is to be seen towards more economy, use of advanced materials, aerodynamic efficiency etc. In the military field in addition high agility, i.e., high maneuverability and high installed power, is required. Derived from the mission task high demands are set in the structural field, esp. the crashworthiness, i.e., high energy absorption by constructional means and specific materials. Dependent on operational requirements as all-weather capability, autonomous navigation, automatic hover the field of equipments of today's and future weapon systems becomes more and more important and complex. Author

N81-33156# National Academy of Sciences - National Research Council, Washington, D. C. Assembly of Engineering.

US MILITARY V/STOL: WHO NEEDS IT? WANTS IT? CAN AFFORD IT?

David C. Hazen *In* AGARD The Impact of Mil. Appl. on Rotorcraft and V/STOL Aircraft Design Jun. 1981 7 p

Avail: NTIS HC A12/MF A01

For a period of thirty years, fixed wing V/STOL technology has been under development. Of all the concepts investigated, only the vectored thrust approach employed in the AV-8A Harrier has found application in the combat forces of the Western World.

This application was itself more the result of a technology push than of any clearly perceived operational pull. Once incorporated in operational units, however, the flexibility of basing displayed by the Harrier led to the evolution of entirely new operation concepts--and the requirement for improved aircraft to meet them. There are clear indications that the vulnerability of aircraft bases both ashore and afloat may make the V/STOL option essential in the future. Constrained by limited budgets and unimpressed by the performance currently available from V/STOL machines, the U.S. Services, other than the Marines, have no plans for introducing V/STOL into their forces, preferring instead to keep the technology on the shelf for future applications. If, however, V/STOL is to be effective in meeting future needs, the operational experience and doctrine to employ it must be developed now to guide the design of the machines that will be required. It is becoming increasingly critical that this Catch 22 be broken--and soon. Author

N81-33158*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ANALYSIS OF THE PERFORMANCE OF THE DRIVE SYSTEM AND DIFFUSER OF THE LANGLEY UNITARY PLAN WIND TUNNEL
Robert L. Stallings and Lowell E. Hasel Oct. 1981 67 p refs
(NASA-TM-83168; L-14543) Avail: NTIS HC A04/MF A01 CSCL 01A

A broad program was initiated at the Langley Research Center in 1973 to reduce the energy consumption of the laboratory. As a part of this program, the performance characteristics of the Unitary Plan Wind Tunnel were reexamined to determine if potential methods for incresing the operating efficiencies of the tunnel could be formulated. The results of that study are summarized. The performance characteristics of the drive system components and the variable-geometry diffuser system of the tunnel are documented and analyzed. Several potential methods for reducing the energy requirements of the facility are discussed. T.M.

N81-33159*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STABILITY AND CONTROL CHARACTERISTICS OF A THREE-SURFACE ADVANCED FIGHTER CONFIGURATION AT ANGLES OF ATTACK UP TO 45 DEG
William P. Henderson and Laurence D. Leavitt Sep. 1981 47 p refs
(NASA-TM-83171; L-14433) Avail: NTIS HC A03/MF A01 CSCL 01A

The tests were conducted at Mach numbers from 0.40 to 0.90, at angles of attack up to 45 deg for the lower Mach numbers, and at angles of sideslip up to 15 deg. The model variations under study included adding a canard surface and deflecting horizontal tails, ailerons, and rudders. T.M.

N81-33160*# Military Academy, West Point, N. Y.
EXPERIMENTAL AND THEORETICAL STUDY OF THREE INTERACTING, CLOSELY-SPACED, SHARP-EDGED 60 DEG DELTA WINGS AT LOW SPEEDS Final Report
H. F. Faery, Jr., J. K. Strozier, and J. A. Ham Washington NASA Oct. 1981 47 p refs Sponsored by NASA
(NASA-CR-3460) Avail: NTIS HC A03/MF A01 CSCL 01A

Wind tunnel tests were conducted to determine the subsonic longitudinal aerodynamic characteristics of lifting configuration consisting of a 60 deg delta main wing with two smaller 60 deg delta wings (called sub-wings) attached underneath. The test was designed to determine the effects on lift, drag, and pitching moment due to various placement of the subwings in relation to the main wing. Test results indicate the increasing vertical separation between the main wing and the sub-wings produced the most significant results: a 23.1% increase in maximum lift coefficient, a reduction in drag coefficient at high lift coefficients, and an increase in longitudinal stability. Lateral separation of the sub-wings produced no significant changes. Placement of the sub-wings rearward increases the initial lift curve slope and maximum lift coefficient and also increase the longitudinal stability. Results of a computer study using a vortex lattice code supported the experimental conclusions. M.G.

N81-33161# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
INVESTIGATION OF UNSTEADY AIRLOADS ON WINGS WITH OSCILLATING CONTROL FOR ACTIVE CONTROL PURPOSES
W. Geissler (DFVLR, Goettingen, West Germany) Jul. 1981 16 p refs Presented at 52nd Meeting of the AGARD Structures and Mater. Panel, Cesme, Turkey, 5-10 Apr. 1981
(AGARD-R-699; ISBN-92-835-1392-2) Avail: NTIS HC A02/MF A01

Intensive experimental investigations were carried out on a wing section with oscillating control including a streamlined gap between both wing parts. Steady as well as unsteady pressure distributions were measured outside and inside the gap region for various incidences, flap angles, and frequencies. In addition to the experimental investigations, a calculation procedure was developed taking into account the real boundaries of the configuration including the gap region and assuming the fixed wing part and the oscillating control as two lifting systems with two Kutta conditions and correspondingly two wakes behind wing and control. Comparisons between theory and experiment are discussed in detail and the major influences and effects of viscosity are pointed out. The results lead to special conclusions for the applicability of lifting systems for active conrol purposes. J.M.S.

N81-33162*# General Dynamics Corp., Fort Worth, Tex.
EVALUATION OF PRESSURE AND THERMAL DATA FROM A WIND TUNNEL TEST OF A LARGE-SCALE, POWERED, STOL FIGHTER MODEL Final Report, 4 Jun. 1980 - 4 Jun. 1981
G. A. Howell, E. L. Crosthwait, and M. C. Witte Jun. 1981 987 p refs
(Contract NAS2-10649)
(NASA-CR-166170) Avail: NTIS HC A99/MF A01 CSCL 01A

A STOL fighter model employing the vectored-engine-over wing concept was tested at low speeds in the NASA/Ames 40 by 80-foot wind tunnel. The model, approximately 0.75 scale of an operational fighter, was powered by two General Electric J-97 turbojet engines. Limited pressure and thermal instrumentation were provided to measure power effects (chordwise and spanwise blowing) and control-surface-deflection effects. An indepth study of the pressure and temperature data revealed many flow field features - the foremost being wing and canard leading-edge vortices. These vortices delineated regions of attached and separated flow, and their movements were often keys to an understanding of flow field changes caused by power and control-surface variations. Chordwise blowing increased wing lift and caused a modest aft shift in the center of pressure. The induced effects of chordwise blowing extended forward to the canard and significantly increased the canard lift when the surface was stalled. Spanwise blowing effectively enhanced the wing leading-edge vortex, thereby increasing lift and causing a forward shift in the center of pressure. Author

N81-33163# ARO, Inc., Arnold Air Force Station, Tenn.
WIND TUNNEL TESTING OF A WINDSHIELD MATERIAL OR SUPERSONIC AIRCRAFT Final Report
D. W. Stallings (Calspan Field Services, Inc.) and A. S. Hartman (Calspan Field Services, Inc.) AEDC May 1981 45 p refs Sponsored by AF
(AD-A103383; AEDC-TSR-81-V18) Avail: NTIS HC A03/MF A01 CSCL 01/3

Wind tunnel tests of windshield material intended for use on supersonic aircraft were conducted in the von Karman Facility Hypersonic Wind Tunnel B at a free-stream Mach number of 6 and tunnel stilling chamber conditions of 146 psia and 495 F. The wedge technique was used to provide a local Mach number of 2.5 over the windshield specimen. Selected results are presented to illustrate the test techniques and typical data obtained. Author (GRA)

N81-33173# Directorate of Nuclear Safety, Kirtland AFB, N.Mex. Air Force Inspection and Safety Center
SAFETY STUDY: PRIME NUCLEAR AIRLIFT FORCE (PNAF) MISSIONS INVOLVING THE USE OF C-130 AND C-141 AIRCRAFT Final Report
John G. Dean Jan. 1981 35 p refs
(AD-A103282; AFISC-TR-81-001) Avail: NTIS HC A03/MF A01 CSCL 01/3

This report estimates the accident rate for C-130 and C-141 aircraft while involved in the air transportation of nuclear weapons as cargo. Causes and factors involved in accidents are shown, and beneficial practices are identified. Author (GRA)

N81-33174# Civil Aeromedical Inst., Oklahoma City, Okla.
IMPROVING THE CRASHWORTHINESS OF GENERAL AVIATION AIRCRAFT BY CRASH INJURY INVESTIGATIONS
William R. Kirkham May 1981 17 p refs Sponsored by FAA
(AD-A103316; FAA-AM-81-10) Avail: NTIS HC A02/MF A01 CSCL 01/2

An accident investigative research program has correlated injuries to aircraft occupants with the accident severity and structural changes in the crash. Findings brought to the attention of aircraft manufacturers have led to specific aircraft being made more crashworthy. Following the finding of a failure in a shoulder harness attachment the manufacturer strengthened the attachment brace. The way a shoulder harness was joined to a lapbelt was modified as a followup to failure of the attachment in an accident. Noted fractures of lapbelt and shoulder harness cable tiedowns led to the use of stronger cables and modification of the installation. Other accident findings resulted in a shoulder strap guide being placed on an inertia reel and a side-mounted seat being modified. GRA

N81-33175# Federal Aviation Administration, Washington, D.C. Office of Aviation Medicine.
EMERGENCY CABIN LIGHTING INSTALLATIONS: AN ANALYSIS OF CEILING- VERSUS LOWER CABIN-MOUNTED LIGHTING DURING EVACUATION TRIALS
Burton P. Chesterfield, Paul G. Rasmussen, and Robert D. Dillon Feb. 1981 46 p refs
(AD-A103191; FAA-AM-81-7) Avail: NTIS HC A03/MF A01 CSCL 01/2

Six series of human subject evacuation tests were conducted to compare the evacuation rates with two different emergency lighting systems in an aircraft cabin filled with nontoxic white smoke. Cabin emergency lighting and exit signs mounted near the ceiling were almost completely obscured by smoke, which layered most heavily in the upper one-half of the cabin. A comparison lighting system mounted below layered smoke in aisle seat armrests, with exit signs mounted at and below the cabin midpoint, provided light directly in the aisle and cross aisle. Results indicated that lights and signs mounted lower in the cabin were more readily visible in smoke and enabled subjects to evacuate from a smoke-filled cabin more rapidly than conventional ceiling-mounted lights and signs. Author (GRA)

N81-33177# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
TEST AND EVALUATION OF AN EXPERIMENTAL FEASIBILITY PROTOTYPE PASSIVE SEAT MOUNTED LIMB RESTRAINT SYSTEM
Marcus Schwartz 20 May 1981 63 p
(AD-A104161; NADC-81065-60) Avail: NTIS HC A04/MF A01 CSCL 13/6

An experimental feasibility prototype of passive seat mounted limb restraint system was tested under various conditions both statically and dynamically on the NAVAIRDEVCEN Ejection Tower and the Dayton T. Brown windblast facility. The Ejection Tower tests resulted in successful and repeatable entrapment of the arm and legs, and good tensioning of the restraint lines through one-way snubbers. The windblast test series also resulted in successful entrapment of the limbs at various pitch and yaw angles up to 600 knots. The results of this T&E study clearly showed the feasibility of the system to provide the necessary protection to the crewmember during the simulated operation environments, and also to meet the passive requirements which results in no additional encumbrances on the crewmember. Author (GRA)

N81-33181# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
MULTISITE TESTING OF THE DISCRETE ADDRESS BEACON SYSTEM (DABS) Interim Report, Mar. - Sep. 1980
J. L. McMillen, J. W. Davis, and R. J. Spadea, Jr. Jul. 1981 61 p refs
(FAA Proj. 034-241-510)
(AD-A103575; FAA-CT-81-9; FAA-RD-81-49) Avail: NTIS HC A04/MF A01 CSCL 17/7

This report contains results of tests performed in an environment of multiple Discrete Address Beacon System (DABS) sensors, one each located at Clementon and Elwood, New Jersey, and the Federal Aviation Administration (FAA) Technical Center, Atlantic City Airport, New Jersey. These DABS sensors were tested in various degrees of intersensor communication that ranged from a full network of connected sensors to a fully nonnetted configuration. The multiple DABS sensors were tested in four major areas: network management, surveillance processing, data link processing, and intersensor communications. It is concluded that the performance of the DABS sensors in multisite configurations meets or exceeds the requirements specified in the DABS engineering requirement (FAA-ER-240-26). Author (GRA)

N81-33182# Federal Aviation Administration, Atlantic City, N.J.
CROSSTALK LEVELS OF SPEECH PLUS DATA IN REMOTE COMMUNICATION AIR-GROUND (RCAG) Final Report, Aug. 1979 - May 1980
Albert J. Rehmann Jun. 1981 61 p refs
(AD-A103351; FAA-CT-80-38) Avail: NTIS HC A04/MF A01 CSCL 17/2

The Federal Aviation Administration (FAA) is proposing the addition of a digital data channel to the existing telephone lines which connect air route traffic control centers (ARTCC's) with Remote Communication Air-Ground (RCAG) sites to economically transfer remote monitoring system (RMS) parameters and control data between the ARTCC's and the sites. FAA Specification FAA-E-2699a establishes the maximum allowable interference level to pilot/controller communications which would be allowed to result from the addition of the data channel. The tests described in this document were designed to verify that the requirements in FAA-E-2699a are sufficient to prevent disturbance to normal air traffic control (ATC) operations. The tests were performed by simulating and existing communications channel using data modems and samples of present-day Voice Frequency Control System (VFCS) equipment. Crosstalk levels of speech and data were measured under actual operating conditions. The test results indicated that the addition of an RMS data channel to existing FAA telephone lines is technically feasible and that the requirement in FAA-E-2699a concerning the data crosstalk in the audio portion of the communication channel is not adequate to prevent disturbance to normal ATC operations. The requirements concerning data crosstalk in the control portion and VFCS crosstalk in the data portion of the channel are sufficient. Author (GRA)

N81-33183# Federal Aviation Administration, Atlantic City, N.J.
EN ROUTE DISCRETE ADDRESS BEACON SYSTEM/AIR TRAFFIC CONTROL (BUILD 1) TECHNICAL TESTING
Robert E. Copes, III and Richard V. Dardano Jul. 1981 35 p
(FAA Proj. 122-115-540)
(AD-A103894; FAA-CT-80-30; FAA-RD-81-31) Avail: NTIS HC A03/MF A01 CSCL 17/7

Tests of the Discrete Address Beacon System (DABS) in an air traffic control (ATC) en route National Airspace System (NAS) environment were conducted at the Federal Aviation Administration (FAA) Technical Center. These tests included: (1) surveillance performance in the areas of track initiation, track continuity, and track swap; and (2) surveillance related communication responses employing the Common International Civil Aviation Organization (ICAO) Data Interchange Network (CIDIN) protocol for Air Traffic Control Radar Beacon System (ATCRBS) identification (ID) requests. Test results indicate that the en route DABS/ATC Build I software successfully processed DABS sensor surveillance information. Although analyzed on a limited basis, the transmission of surveillance related communication messages between the DABS sensor and the en route DABs/ATC Build I system is considered to operate as expected. It is concluded that the DABS/ATC en route Build I system accepts, processes, tracks, and displays DABS and ATCRBS surveillance data from one DABS and multiple ATCRBS sensors with no degradation to the baseline function of the NAS software system A3d2.4. Author (GRA)

N81-33184# Federal Aviation Administration, Washington, D.C. Air Traffic Service.
OPERATION FREE FLIGHT: AN OPERATIONAL EVALUATION OF DIRECT ROUTE FLIGHT PLAN FILING IN TODAY'S NATIONAL AEROSPACE SYSTEM Final Report
Wayne Minnick Jul. 1981 87 p
(AD-A104150; FAA-AT-81-1) Avail: NTIS HC A05/MF A01 CSCL 17/7

This report presents the results of an operational evaluation concerning the feasibility of permitting the filing of direct route flight plans, without route definition, between departure and arrival area fixes serving selected city-pairs. The evaluation was conducted with the voluntary participation of Eastern, United, and Pan American Airlines during the period June 1 through December 31, 1980. Objectives of Operation Free Flight were to obtain factual information about air traffic control (ATC) handling of test aircraft on direct routings, system prohibitions to the concept, general pilot attitude regarding the utility of their RNAV equipment, potential fuel savings, and ATC system impact. The evaluation was conducted throughout the contiguous United States between 27 city-pairs. The primary conclusions were: the operational concept of filing direct, great circle routes between departure and arrival area fixes, at altitudes above Flight Level 290, in a radar environment; incompatibility with traffic arrival flow at destination airports was determined to be the most significant system prohibition; pilot attitude was skewed in a positive direction; potential fuel savings are projected to be in excess of 40,000,000 gallons per year, and, there was no adverse impact to the ATC system. Author (GRA)

N81-33188# Transportation Research Board, Washington, D.C.
COMPUTER GRAPHICS APPLICATIONS
Michael R. Couture, Jerome M. Lutin, Dale Livingston, Edward J. Kobialka, and Neil W. Polhemus 1980 42 p refs
(PB81-215246; TRB/TRR-787; ISBN-0-309-03201-6; LC-81-9570; ISSN-0361-1981) Avail: NTIS HC A03/MF A01 CSCL 17G

Issues in computer graphics application are reported. The following areas are discussed: (1) computer graphics for transit planning, an empirical study, (2) interactive graphics model for testing stochastic traffic assignment algorithms, (3) use of computer graphics to analyze navigational performance and jet route separation, (4) applications of interactive graphics in Michigan's statewide transportation modeling system. GRA

N81-33190*# Beech Aircraft Corp., Wichita, Kans.
APPLICATION OF ADVANCED TECHNOLOGIES TO DERIVATIVES OF CURRENT SMALL TRANSPORT AIRCRAFT Final Report
P. P. Renze and J. E. Terry Jul. 1981 112 p refs
(Contract NAS2-10571)
(NASA-CR-166197) Avail: NTIS HC A06/MF A01 CSCL 01C

Mission requirements of the derivative design were the same as the baseline to readily identify the advanced technology benefits achieved. Advanced technologies investigated were in the areas of propulsion, structures and aerodynamics and a direct operating cost benefit analysis conducted to identify the most promising. Engine improvements appear most promising and combined with propeller, airfoil, surface coating and composite advanced technologies give a 21-25 percent DOC savings. A 17 percent higher acquisition cost is offset by a 34 percent savings in fuel used. T.M.

N81-33191*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
STATISTICS OF SOME ATMOSPHERIC TURBULENCE RECORDS RELEVANT TO AIRCRAFT RESPONSE CALCULATIONS
William D. Mark and Raymond W. Fischer Washington NASA Sep. 1981 238 p refs
(Contract NAS1-14837)
(NASA-CR-3464) Avail: NTIS HC A11/MF A01 CSCL 01C

Methods for characterizing atmospheric turbulence are described. The methods illustrated include maximum likelihood estimation of the integral scale and intensity of records obeying the von Karman transverse power spectral form, constrained least-squares estimation of the parameters of a parametric representation of autocorrelation functions, estimation of the power spectra density of the instantaneous variance of a record with temporally fluctuating variance, and estimation of the probability density functions of various turbulence components. Descriptions of the computer programs used in the computations are given, and a full listing of these programs is included. T.M.

N81-33192# Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.
ANALYSIS AND DESIGN OF SUPERSONIC AIRCRAFT BASED ON INVISCID NONLINEAR EULERIAN EQUATIONS. PART 1: ROTATIONAL EULER SOLUTIONS WITH EXPLICIT SHOCK FITTING Final Report, 1 Oct. 1977 - 1 Apr. 1979
M. J. Siclari and F. Marconi Oct. 1980 118 p refs
(Contract F33615-77-C-3126; AF Proj. 2404)
(AD-A103434; RE-623-Pt-1; AFWAL-TR-80-3110-Pt-1) Avail: NTIS HC A06/MF A01 CSCL 01/3

A computer program has been developed to compute the inviscid supersonic flow over delta wings and smooth wing-body configurations. A second-order accurate predictor-corrector finite-difference scheme is used to integrate the three dimensional Euler equations in regions of continuous flow. Bow shock and crossflow-induced embedded shocks are explicitly computed as discontinuities which simultaneously satisfy the characteristic and the Rankine-Hugoniot conditions. In computing the flow about complex wing cross sections, the use of appropriate conformal mappings was an important factor in developing a computational mesh capable of resolving the large flow gradients that are inevitable in the vicinity of wing leading edges. Geometry programs were developed to supply the appropriate geometric boundary conditions necessary to compute complex wing cross sections. New starting solutions were developed that were more appropriate to thin-wing cross sections. In the initial stage of development, the flow about conical wings was computed for a two-fold purpose. Conical Euler solutions would be used as starting conditions for conical wing-bodies and three dimensional wings and the conical problem would uncover potential problem areas in the computation of these flows without the added complexity of geometrical variations. The conical problem led to the development of special techniques to resolve the vortical layer that inevitably develops on the body surface. Typical results are shown for subsonic and supersonic leading edge delta wings and wing-body combinations. GRA

N81-33194# Naval Ship Research and Development Center, Bethesda, Md. Aviation and Surface Effects Dept.
DESIGN OF A SLOT HEIGHT DISTRIBUTION FOR INCREASED HOVER CONTROL POWER ON A CIRCULATION CONTROL ROTOR Final Report
Daniel W. Poe Dec. 1980 31 p refs
(AD-A103535; DTNSRDC/ASED-80/24) Avail: NTIS HC A03/MF A01 CSCL 01/3

The Circulation Control Rotor Performance Prediction computer program was used with the XH-2/CCR rotor configuration to determine a slot height distribution that would improve control power in hover without causing excessive cyclic pressure requirements for trim in forward flight. Effects of total slot area as well as distribution were considered. The final distribution was constrained by a minimum practical slot height setting of 0.002 in. and a minimum unpressurized blade slot area of 3.0 square inches. Several distributions were evaluated. Noteworthy trends that emerged are: (1) A negatively tapered slot height distribution is favorable to producing hub moments in hover, and (2) a uniform distribution (zero taper) requires the lowest cyclic pressure for trim at 120 knots. The final distribution selection exhibited a 38-percent improvement in predicted hub moment over a slot height distribution previously used on the flight demonstrator. Author (GRA)

N81-33195# Tennessee Univ. Space Inst., Tullahoma.
A FLIGHT TEST EVALUATION OF THE BALL-BARTOE JETWING PROPULSIVE LIFT CONCEPT Progress Report, 18 Apr. 1980 - 17 Apr. 1981
Ralph D. Kimber 1 Jul. 1981 191 p refs
(Contract N00019-80-C-0126)
(AD-A103579; UTSI-81-1) Avail: NTIS HC A09/MF A01 CSCL 01/3

The need for military aircraft that will operate from short unimproved airfields, and the decks of smaller aircraft carriers has increased in recent years due to a changing world situation and the shrinking of the dollar. Such aircraft need to be fuel efficient, quiet, maneuverable, have low infrared signature, and carry a large useful load. The Ball-Bartoe 'Jetwing' is a single engine upper surface blowing concept which offers the possibility of achieving these objectives. The 'Jetwing' concept achieves supercirculation lift and STOL performance by ducting all engine air through the leading edge of the wing and ejecting it over the top surface of the wing through a slot nozzle. This nozzle extends along approximately 70% of the wing span. A Coanda flap is mounted at the trailing edge of the blown portion of the wing. In addition to the main wing, a smaller wing panel is mounted above the slot nozzle. The air passage between the main wing and the smaller upper wing acts as an ejector to reduce installed thrust losses. For high speed applications that concept may be used without this upper wing. A thrust reversing method is also incorporated into the concept. The thrust is reversed by rotating the top of the slot nozzle so as to close the nozzle and open a reverse flow path. This report covers the flight test program of the Jetwing research airplane. GRA

N81-33196# Dayton Univ., Ohio. Research Inst.
ALTERNATE T-38 TRANSPARENCY DEVELOPMENT. PART 1: INITIAL ANALYSIS AND DESIGN Final Report, Jan. 1979 - Sep. 1980
Blaine S. West and Kenneth I. Clayton Wright-Patterson AFB, Ohio AFWAL Nov. 1980 58 p refs 2 Vol.
(Contracts F33615-76-C-3103; F33615-80-C-3401; AF Proj. 2202; AF Proj. 1926)
(AD-A103261; UDR-TR-80-91-Pt-1; AFWAL-TR-80-3132-Pt-1) Avail: NTIS HC A04/MF A01 CSCL 01/3

T-38 missions at speeds above the existing crew enclosure damage threshold will result in flight safety risk to aircraft and crew. This report documents the design development of alternate T-38 transparencies having the capability of defeating the impact of a four pound bird at aircraft speeds up to 400 knots. To accomplish the desired windshield/canopy redesign, a feasibility study was conducted, damage probability was determined, the birdstrike capability of existing transparencies was experimentally evaluated, edge attachment screening specimens were laboratory tested, and finite element analyses were made. Major findings from each task have been integrated into the detail design of a birdstrike resistant forward windshield panel, recommended for full-scale hardware fabrication, testing, and evaluation. Forward canopy and instructor windshield concepts are also discussed. Author (GRA)

N81-33197# Dayton Univ., Ohio. Research Inst.
ALTERNATE T-38 TRANSPARENCY DEVELOPMENT. PART 2: BASELINE BIRDSTRIKE TESTING Final Report, Jun. 1979 - Oct. 1980
Blaine S. West Wright-Patterson AFB, Ohio AFWAL Dec. 1980 92 p 2 Vol.
(Contracts F33615-76-C-3103; F33615-80-C-3401; AF Proj. 2202; AF Proj. 1962)
(AD-A103262; UDR-TR-80-61-Pt-2; AFWAL-TR-80-3132-Pt-2) Avail: NTIS HC A05/MF A01 CSCL 01/3

T-38 missions at speeds above the existing crew enclosure damage threshold will result in flight safety risk to aircraft. This report documents the results of a full-scale flight hardware test program to establish the bird impact resistance of existing T-38 forward transparencies. The failure threshold for the forward windshield and forward canopy for a four-pound birdstrike at six impact locations was established. Test results are reported and discussed in detail. Author (GRA)

N81-33199# Calspan Corp., Buffalo, N. Y.
AN EXPERIMENTAL INVESTIGATION OF VTOL FLYING QUALITIES REQUIREMENTS OR SHIPBOARD LANDINGS Final Report, Apr. 1978 - Sep. 1980
Robert C. Radford, Dominick Andrisani, II, and John L. Beilman Aug. 1981 262 p refs
(Contract N62269-78-C-0043)
(AD-A104137; CALSPAN-6286-F-1; NADC-77318-60) Avail: NTIS HC A12/MF A01 CSCL 01/2

This fifth simulation experiment, using the U.S. Navy X-22A variable stability V/STOL aircraft, was undertaken to generate data for the development to flying qualities and advanced flight control system design criteria for the visual shipboard landing task. Since a broad range of flying qualities was simulated, actual landings were not performed because of flight safety considerations. Instead, a discrete three dimensional position tracking task, presented to the pilot on a Head-Up-Display (HUD), was devised to evoke pilot control and stabilization activity similar to that in the actual shipboard environment. A microwave landing system with precision ranging capability served as the guidance sensor for both the translational rate flight control system mechanizations and for the HUD tracking information. A total of 3 evaluations were performed of various horizontal and vertical translational rate flight control system dynamics. The primary results of the program defined regions of satisfactory and acceptable flying qualities as functions of velocity command gain and the time constant of velocity response. The limits on command gain and time constant for satisfactory flying qualities indicated by this experiment are considerably smaller than those determined in ground simulator experiments. Author (GRA)

N81-33200# Sandia Labs., Albuquerque, N. Mex. Div. 1556.
ADVANCED COMPOSITE AIRCRAFT ELECTROMAGNETIC DESIGN AND SYNTHESIS
R. F. Wallenberg (Syracuse Research Corp., N.Y.), J. A. Birken (Naval Air System Command, Washington, D.C.), and O. Milton Apr. 1981 9 p refs Presented at the IEEE Intern. Symp. on Electromagnetic Compatability Record, Boulder, Colo., 18-20 Aug. 1981
(Contract DE-AC04-76DP-00789)
(SAND-81-1278C; CONF-810816-1; SRC-TR-81-1170) Avail: NTIS HC A02/MF A01

The ramifications of using advanced composite materials in more upcoming aircraft were investigated. Mission requirements include fly by wire systems surviving increased threats when contained in a composite material fuselage which generally provides poor electromagnetic shielding. The coupling of lightning and a nuclear electromagnetic pulse to aircraft comprised of composite materials are addressed. DOE

N81-33201# Peat, Marwick, Mitchell and Co., San Francisco, Calif.
RESPONSES TO COMMENTS OF AIR TRANSPORT ASSOCIATION OF AMERICA ON AIRCRAFT TOWING FEASIBILITY STUDY
Jun. 1981 112 p refs
(Contract DE-AC01-79CS-50069)
(DE81-029834; DOE/CS-50069/T1) Avail: NTIS HC A06/MF A01

A preliminary assessment of the constraints on and feasibility of extended aircraft towing between airport runways and terminal gate areas with engines shutdown is made. Past aircraft towing experience and the state of the art in towing equipment are reviewed. Safety and operational concerns associated with aircraft towing are identified, and the benefits and costs of implementing aircraft towing at 20 major US airports are analyzed. It was concluded that extended aircraft towing is technically feasible and that substantial reductions in aircraft fuel consumption and air pollutant emissions can be achieved through its implementation. It was also concluded that, although capital and operating costs associated with towing would be increased, net savings could generally be attained at these airports. Because of the lack of past experience and the necessity of proving the cost effectiveness of towing concept, a demonstration of the feasibility of large scale aircraft towing is necessary. DOE

N81-33203*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMULATOR EVALUATION OF SEPARATION OF DISPLAY PARAMETERS IN PATH-FOLLOWING TASKS
Garimella R. Sarma and James J. Adams Oct. 1981 44 p refs
(NASA-TP-1915; L-14590) Avail: NTIS HC A03/MF A01 CSCL 01D

A five degree of freedom, fixed base simulation changing the location of the displays for bank angle, pitch angle, heading angle, and the vertical and lateral displacement from an instrument landing system path was studied. It is shown that the accuracy of the lateral path following and the pilot aircraft system dynamic characteristics deteriorate when bank angle is displayed separated from the other attitudes. It is found that best results are obtained when bank, heading, and pitch angles are displayed together and vertical and lateral displacements are displayed at another location in the display. E.A.K.

N81-33204# Aircraft Research and Development Unit, Edinburg (Australia).
DEVELOPMENT OF AN INSTRUMENT FOR THE ACCURATE MEASUREMENT OF AIRCRAFT AIRSPEED AND ALTITUDE
G. G. Readett Jul. 1981 28 p refs
(AD-A103421; ARDU-TI-466) Avail: NTIS HC A03/MF A01 CSCL 01/4

Aircraft Research and Development Unit has developed a trailing pitot-static probe suitable for determining pressure error corrections for aircraft airspeed and altitude systems. The instrument is suitable for use with helicopters where both pitot and static pressure measurements on the aircraft could be subject to pressure errors due to rotor downwash. The probe is accurate to better than 1% and was tested and shown to be satisfactory over a speed range of 40 to 120 knots. Author (GRA)

N81-33205*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.
DEVELOPMENT OF AN ANALYTICAL TECHNIQUE FOR THE OPTIMIZATION OF JET ENGINE AND DUCT ACOUSTIC LINERS Semiannual Status Report, 3 Jan. - 31 Aug. 1981
Ben T. Zinn and William L. Meyer 1981 30 p refs
(Grant NAG1-133)
(NASA-CR-164872) Avail: NTIS HC A03/MF A01 CSCL 21E

A special integral representation of the external solutions of the Helmholtz equation is described. The analytical technique developed for the generation of the optimum acoustic admittance for an arbitrary axisymmetric body is also presented along with some numerical procedures and some preliminary results for a straight duct. A.R.H.

N81-33206*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMPLIFIED OFF-DESIGN PERFORMANCE MODEL OF A DAY TURBOFAN ENGINE CYCLE
Frederick J. Lallman Sep. 1981 33 p refs
(NASA-TM-83204) Avail: NTIS HC A03/MF A01 CSCL 21E

The specific thrust and fuel-air ratio for a dry turbofan engine cycle were calculated for several power levels over a range of altitudes and Mach numbers. The engine has a design fan pressure ratio of 2.9, compressor pressure ratio of 8.0, and bypass ratio of 0.6. Nominal engine component curves were picked to approximate the calculated data to construct a simplified model of the off-design performance of the engine. The model was then used to construct a simplified design-point engine model for the full-power condition. Author

N81-33210*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROPULSIVE LATERAL CONTROL NOZZLE Patent Application
Paul L. Coe, Jr. and Albert B. Graham, inventors (to NASA) (Old Dominion Univ.) Filed 18 Nov. 1980 9 p
(NASA-Case-LAR-12136-1; US-Patent-Appl-SN-208093) Avail: NTIS HC A02/MF A01 CSCL 01C

The invention relates to a trailing edge flap system useful in increasing low speed lift and low speed roll control in supersonic aircraft. Two trailing edge flaps (upper and lower) extend from the aircraft's engine exhaust nozzle. In the high lift mode of operation, a diverter block pushes the upper flap away from the nozzle, thereby exposing a flow passageway. Exhaust flow through the passageway tends to decrease boundary layer separation. To provide propulsive lateral control, the diverter block of one wing may be selectively closed, thereby reducing the lift on that wing. NASA

N81-33211*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMULATOR EVALUATION OF THE EFFECTS OF REDUCED SPOILER AND THRUST AUTHORITY ON A DECOUPLED LONGITUDINAL CONTROL SYSTEM DURING LANDINGS IN WIND SHEAR
G. Kimball Miller, Jr. Oct. 1981 51 p refs
(NASA-TM-83188; L-14652) Avail: NTIS HC A04/MF A01 CSCL 01C

The effect of reduced control authority, both in symmetric spoiler travel and thrust level, on the effectiveness of a decoupled longitudinal control system was examined during the approach and landing of the NASA terminal configured vehicle (TCV) aft flight deck simulator in the presence of wind shear. The evaluation was conducted in a fixed-base simulator that represented the TCV aft cockpit. There were no statistically significant effects of reduced spoiler and thrust authority on pilot performance during approach and landing. Increased wind severity degraded approach and landing performance by an amount that was often significant. However, every attempted landing was completed safely regardless of the wind severity. There were statistically significant differences in performance between subjects, but the differences were generally restricted to the control wheel and control-column activity during the approach. M.G.

N81-33214# Army Cold Regions Research and Engineering Lab., Hanover, N. H. Geotechnical Research Branch.
FABRIC INSTALLATION TO MINIMIZE REFLECTION CRACK ON TAXIWAYS AT THULE AIRBASE, GREENLAND
Robert A. Eaton and Randy Godfrey May 1981 35 p refs
(DA Proj. 4K0-78012-AAM-1)
(AD-A103737; CRREL-SR-81-10) Avail: NTIS HC A03/MF A01 CSCL 13/2

In August 1978 two types of fabrics were placed on sections of taxiways 1 and 3 of Thule AB, Greenland, to study the ability of fabrics with an AC 2.5 overlay to minimize reflection cracking in severe climates. Both fabrics should retain durability and mechanical strength under Thule's arctic conditions. Author (GRA)

N81-33216# Mitre Corp., McLean, Va.
UPGRADED FAA AIRFIELD CAPACITY MODEL. VOLUME 1: SUPPLEMENTAL USER'S GUIDE
William J. Swedish Washington FAA Feb. 1981 119 p refs
(Contract DT-FA01-81-C-10001)
(AD-A104154; MTR-81W16-Vol-1; FAA-EM-81-1-Vol-1) Avail: NTIS HC A06/MF A01 CSCL 01/2

Input and output formats for easier usage and for the capability to compute runway capacity for up to eleven different percentages of arrivals in a single run (as opposed to a separate run for each percentage) are presented. Provisions for calculating the capacity of alternating arrivals to a pair of parallel runways are highlighted. Several other runway configurations were added to the model. Other changes made to the internal logic of the model which results in reduced running times and/or improved accuracy. The resulting capacities may, therefore, differ from the results obtained with the previous version. In most cases this will not affect the ranking of the potential airfield changes under evaluation. T.M.

N81-33217# Mitre Corp., McLean, Va.
UPGRADED FAA AIRFIELD CAPACITY MODEL. VOLUME 2: TECHNICAL DESCRIPTION OF REVISIONS
William J. Swedish Washington FAA Feb. 1981 161 p refs
(Contract DT-FA01-81-C-10001)
(AD-A104155; MTR-81W16-Vol-2; FAA-EM-81-1-Vol-2) Avail: NTIS HC A08/MF A01 CSCL 01/2

The FAA Airfield Capacity Model, a computer program designed to quickly calculate the runway capacity of an airport, has recently been upgraded. Several new features have been implemented in the upgraded version. Among these are improved input and output formats for easier usage, the capability to compute runway capacity for up to eleven different percentages of arrivals in a single run (as opposed to a separate run for each percentage), and provisions for calculating the capacity of alternating arrivals to a pair of parallel runways. Several other runway configurations have been added to the model, or improved, as well. Other changes have been made to the internal logic of the model which will result in reduced running times and/or improved accuracy. The resulting capacities may, therefore, differ from the results obtained with the previous version. In most cases this will not affect the ranking of the potential airfield changes under evaluation. This report documents the upgraded FAA Airfield Capacity Model. Volume 2 is a detailed technical description of the revisions to the program, including flow charts of the logic and evaluations of various alternative logics. This volume is intended as a programmer's guide, but it may also be useful for the experienced analyst who desires a fuller understanding of the model. GRA

N81-33238# National Aerospace Lab., Tokyo (Japan). First Airframe Div.
ANTI-SYMMETRIC ELASTIC PROPERTIES OF COMPOSITE PLATES OF SATIN WEAVE CLOTH
Takashi Ishikawa Jan. 1981 18 p refs
(NAL-TR-649T; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

Composite plates made of satin weave fabric show macroscopic antisymmetricity and coupling effects. The essential mechanism of such behavior is basically clarified. Closed form solutions of the upper and lower bounds of the stiffness and compliance are obtained by the simplest series model in connection with the uniform stress and strain assumptions. Finite element analyses using 3-D isoparametric elements are also conducted. The solutions fall between both bounds within a certain restriction. The deviation of the actual quasimicromechanical conditions from the simple assumptions can be observed through the FEM results. Rough estimation of thermal warping coefficients is carried out for carbon/epoxy and glass/polyimide 8th harness satin composites by simple measurements. More accurate results are provided by experiments for measuring thermal deflection under a small temperature change. These results confirm the theoretical predictions by both methods. Several comments on ways of preventing such phenomena are made based on the geometry of the fabric structures. Author

N81-33240# SRI International Corp., Menlo Park, Calif.
ENGINEERING EFFECTS OF ADVANCED COMPOSITE MATERIALS ON AVIONICS Final Technical Report, Sep. 1980 - Jun. 1981
W. Graf, J. Hamm, J. E. Navevicz, and D. E. Tremain Jul. 1981 132 p refs
(Contract DAAK80-80-C-0806)
(AD-A104015; USAAVRADCOM-80-0806-F) Avail: NTIS HC A07/MF A01 CSCL 11/4

This report discusses the effects of advanced composite materials on avionics equipment. Over 80 reports and articles on this subject have been collected; the bibliographic data resides in an on-line computer data base. A summary of previous and ongoing work is included. The impact of composite materials on avionics systems and subsystems is discussed, and the major problem areas identified (viz., lightning, EMP protection, antenna performance, EMI/EMC, and radar cross section reduction). Possible solutions and approaches to these problems are presented and the importance of tradeoff studies at the system level is stressed. Problems peculiar to helicopters are reviewed separately. The relation of this contract to the Advanced Composite Airframe Program (ACAP) is also discussed. Appendices present technical background on interference control and E3 hardening concepts. An extensive bibliography is included. Author (GRA)

N81-33241# General Dynamics/Convair, San Diego, Calif.
DEVELOPMENT OF ADVANCED INTERCEPTOR SUBSTRUCTURAL MATERIAL Final Report, 5 Sep. 1979 - 30 Sep. 1980
Norman R. Adsit and Julius Hertz Jul. 1981 129 p refs
(Contract DAAG46-79-C-0081; DA Proj. 1W1-62113-A-661)
(AD-A103836; AMMRC-TR-81-32) Avail: NTIS HC A07/MF A01 CSCL 11/4

The work reported herein is aimed at the development of ultra-high-modulus graphite/epoxy structures for use in future advanced*terminal interceptors (ATI). The work has shown that gore section layup used to fabricate interceptor frusta do not effect the strength or modulus of the frusta. Tests on flat panels representation of full thickness joints substantiated that the end joints will carry ATI loads. Finally, two short but full thickness frusta with antenna window cutouts were fabricated and tested. These frusta met the design goals. Analysis work has been completed and the design and materials are ready for a full-scale demonstration. To accomplish this, the preliminary design was reviewed and has been updated. A full-scale tool was designed and has been procured. Finally, a manufacturing process plan for the full-scale frustum was prepared. GRA

N81-33390# Ball Aerospace Systems Div., Boulder, Colo.
ADVANCED MICROSTRIP ANTENNA DEVELOPMENT. VOLUME 1: TECHNOLOGY STUDIES FOR AIRCRAFT PHASED ARRAYS Final Report, Apr. 1979 - Jun. 1980
Gary G. Sanford Jun. 1981 75 p refs
(Grant DOT-TSC-1397)
(AD-A103837; FAA-EM-80-11-Vol-1; TSC-FAA-80-15-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 09/1

Work has continued on improvement of microstrip phased-array antenna technology since the first microstrip phased-array was flight-tested during the FAA 1974-1975 ATS-6 test program. The present development has extended this earlier work in three areas: the microstrip radiating elements, the array configuration, and the control circuitry. The effort has been successful in developing important new phased-array techniques. These techniques were demonstrated with working hardware, but a complete array was not within the scope of the program. Radiating elements with broad beamwidths were required to permit steering the array to angles near endfire. The most significant improvement was the development of a microstrip crossed-slot element. Dual-band or broad-band elements were developed to permit operation in both the receive and transmit bands. Several approaches were experimented with, the most promising of which was the use of stacked crossed-slot elements. This achieves broad beamwidth and dual-band operation in a compact device. Static arrays for end-fire operation were investigated, and a 4x4 array demonstrated promise for this application. Several phase shifters were developed; the three-bit switched-line phase shifters gave excellent performance. GRA

N81-33392# Network Analysis Corp., Vienna, Va.
COMPUTER B (NAS-NAS) COMMUNICATIONS SUPPORT Final Report
Jul. 1981 171 p refs
(Contract DOT-FA79WA-4335)
(AD-A104145; NAC/FR-303F/01; FAA-RD-81-68) Avail: NTIS HC A08/MF A01 CSCL 17/2

An analysis has been performed to determine the feasibility and desirability of incorporating into NADIN the message traffic currently serviced by the Computer B (NAS-NAS) Network. The use of NADIN to support NAS-NAS communications was found to be feasible and cost-effective. The most attractive approach to such support was found to be the enhancement of the NADIN architecture, using packet-switching technology, to provide virtual circuit and alternate routing capabilities between all NADIN backbone modes. The results of this analysis are to serve as inputs to other tasks under this contract that will investigate a consolidated NADIN enhancement approach for supporting future FAA data communications requirements, including enhancements to support the replacement of FAA's enroute computer system, and the Remote Maintenance Monitoring System. Author (GRA)

N81-33393# Harris Corp., Melbourne, Fla.
TENT SHAPED PHASED ARRAY Interim Report
C. A. Chuang Griffiss AFB, New York RADC Jun. 1981 70 p refs
(Contract F19628-79-C-0173; AF Proj. 4600)
(AD-A103927; RADC-TR-81-116) Avail: NTIS HC A04/MF A01 CSCL 09/5

This interim report presents the study results of a tent shaped phased array SHF aircraft antenna for Satellite Communications. The antenna consists of four planer phased arrays and has a low profile streamlined configuration. The tent array provides electrical scanning over a hemisphere and is capable of high power transmission. The design of the array is a trade-off of the key parameters including antenna coverage, gain, aerodynamic impact, high power transmission, and array packaging. The detailed design considerations of these parameters are presented. A design procedure is given to derive an optimum tent array configuration. The design of a 20 dB gain tent array is discussed. This array consists of square waveguide elements, septum polarizers, ferrite and diode phase shifters, a unique feed network, and a microprocessor for array control. The array depth has a significant impact on the aerodynamic effects and array packaging. The development and design of compact array components to reduce the array depth and to provide high power capability is the key factor to the successful application of the tent array. The extension of the 20 dB gain design to a 30 dB gain array is also included. A breadboard planar array, to test the performance of the array and components, and verify the concept of the tent shaped phased array, is being implemented in this effort.
Author (GRA)

N81-33503# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
MANUAL ON THE FATIGUE OF STRUCTURES. 2: CAUSES AND PREVENTION OF DAMAGE. 7: MECHANICAL SURFACE DAMAGE
W. G. Barrois (l'Armement (Air), Vanves, France) Jun. 1981 140 p refs
(AGARD-MAN-10(ENG); ISBN-92-835-1389-4) Avail: NTIS HC A07/MF A01

Surface damage to aircraft structures is often the origin of fatigue cracks. Damage arising from decarburization and wheel grinding; friction and severe wear; rolling fatigue; contact fatigue; fretting fatigue, and erosion by solid and liquid particles and cavitation is examined. Damage in gears, cams, rails, and bearings are discussed as well as to the surface of metals transparent materials, reinforced plastics, and laminates. A.R.H.

N81-33945*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FLIGHT TEST OF A PURE-TONE ACOUSTIC SOURCE

Arnold W. Mueller and John S. Preisser Oct. 1981 39 p refs
(NASA-TP-1898; L-14600) Avail: NTIS HC A03/MF A01 CSCL 20A

Static and flight testing of a pure-tone acoustic source were conducted in order to: (1) determine if a 4-KHz tone radiated by a source in flight and mixed with broadband aircraft flyover noise could be measured on the ground with a high degree of statistical confidence; (2) determine how well a comparison could be made of flight-to-static tone radiation pattern and a static radiation pattern; and (3) determine if there were any installation effects on the radiation pattern due to the flight vehicle. Narrow-band acoustic data were measured and averaged over eight microphones to obtain a high statistical confidence. The flight data were adjusted to an equivalent static condition by applying corrections for retarded time, spherical spreading, atmospheric absorption, ground impedance, instrumentation constraints, convective amplification, and the Doppler shift. The flight-to-static results are in excellent agreement with the measured static data. No installation effects were observed on the radiation pattern. M.G.

N81-33946*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NOISE SUPPRESSION CHARACTERISTICS OF PERIPHERALLY SEGMENTED DUCT LINERS

Willie R. Watson Sep. 1981 43 p refs
(NASA-TP-1904; L-14521) Avail: NTIS HC A03/MF A01 CSCL 20A

The acoustic fields and transmission losses produced in semi-infinite circular ducts with peripherally segmented liners are analyzed using a series expansion of hard-wall duct modes. The coefficients of the series are computed using Galerkin's method. Unlike finite element approaches, this analysis includes the effects of realistic sources and the number of peripheral strips need not be small. It is shown that peripherally segmented liners redistribute the acoustic energy in waves composed of only a single circumferential mode at the source into other waves which contain a multitude of circumferential modes in the lined section. The accuracy of eigenfunctions computed from the analysis was observed to increase as either the frequency or radial mode order increased. The transmission losses were found to be accurate at frequencies above the cut-on value of the first-order radial mode in a hard-wall duct. The results show that for plane wave sources, peripherally segmented liners may attenuate as much sound as an optimized uniform liner at the optimal point while giving more noise suppression at most other frequencies. M.G.

N81-33947*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

COMPUTER PROGRAM TO PREDICT AIRCRAFT NOISE LEVELS

Bruce J. Clark Sep. 1981 146 p
(NASA-TP-1913; E-733) Avail: NTIS HC A07/MF A01 CSCL 20A

Methods developed at the NASA Lewis Research Center for predicting the noise contributions from various aircraft noise sources were programmed to predict aircraft noise levels either in flight or in ground tests. The noise sources include fan inlet and exhaust, jet, flap (for powered lift), core (combustor), turbine, and airframe. Noise propagation corrections are available for atmospheric attenuation, ground reflections, extra ground attenuation, and shielding. Outputs can include spectra, overall sound pressure level, perceived noise level, tone-weighted perceived noise level, and effective perceived noise level at locations specified by the user. Footprint contour coordinates and approximate footprint areas can also be calculated. Inputs and outputs can be in either System International or U.S. customary units. The subroutines for each noise source and propagation correction are described. A complete listing is given. A.R.H.

N81-33948# Transportation Systems Center, Cambridge, Mass.

HELICOPTER NOISE ANALYSIS: ROUND-ROBIN TEST Final Report, Jan. 1980 - May 1981

Edward J. Rickley Aug. 1981 79 p refs
(AD-A103724; TSC-FAA-81-13; FAA-AEE-81-13) Avail: NTIS HC A05/MF A01 CSCL 20/1

This report documents the results of an international round robin test on the analysis of helicopter noise. Digital spectral noise data of a 3.5 second simulated helicopter flyover and identical analog test tapes containing helicopter noise data, reference signals, test tones and time code signals were sent to 13 participating organizations. The purpose of the test was to evaluate data reduction systems and procedures; to determine the magnitude of the variability between representative systems and organizations; and to identify potential causes and assist in establishing recommended procedures designed to minimize the variablity. Author (GRA)

N81-34108# Department of Transportation, Washington, D. C. Office of Univ. Research.

PUBLISHED RESULTS OF THE PROGRAM OF UNIVERSITY RESEARCH. TRANSPORTATION RESEARCH RESULTS

Helen L. Whitfield and Russell A. Capelle 1980 61 p
(PB81-210130) Avail: NTIS HC A04/MF A01 CSCL 13F

This bibliography contains approximately 400 citations of published reports from transportation related research. Topics covered include automotive technology, energy efficiency and management, transport of hazardous materials, land use/economic impacts of transportation, and rail/guideway development. J.M.S.

N81-34109# Metropolitan Transportation Authority, Inc., New York.

DUAL-POWERED GAS TURBINE/ELECTRIC (GT/E) COMPUTER COMMUTER RAIL CARS: TEST, EVALUATION AND ECONOMICS Final Report

Donald Raskin, Charles Stark, and L. T. Klauder 5 Sep. 1980 52 p refs Sponsored in part by Urban Mass Transportation Administration, New York State Dept. of Transportation and AiResearch Mfg. Co.
(PB81-211757; UMTA-NY-06-0005-80-1) Avail: NTIS HC A04/MF A01 CSCL 13F

Eight prototype gas turbine/electric (GT/E) cars, four from the General Electric Co. (GE) and four from the Garrett Corp. were operated in revenue service on the Long Island Rail Road (LIRR). The design considerations that lead to the configuration of the GT/E cars and a description of the cars as built by GE and Garrett are presented. The costs of using GT/E trains to provide direct service to New York from select nonelectrified lines are compared with costs of extending electrification over those lines and operating conventional MU trains. Three rail lines are examined: the LIRR Port Jefferson and Oyster Bay branches, the Conrail's Upper Hudson to Poughkeepsie. GRA

N81-34138*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AMES RESEARCH CENTER PUBLICATIONS: A CONTINUING BIBLIOGRAPHY, 1981

Aug. 1981 261 p
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Thes bibliography lists formal NASA publications, journal articles, books, chapters of books, patents, contractor reports, and computer programs that were issued by Ames Research Center and indexed by Scientific and Technical Aerospace Reports, Limited Scientific and Technical Aerospace Reports, International Aerospace Abstracts, and Computer Program Abstracts in 1980. Citations are arranged by directorate, type of publication, and NASA accession numbers. Subject, personal author, corporate source, contract number, and report/accession number indexes are provided. A.R.H.

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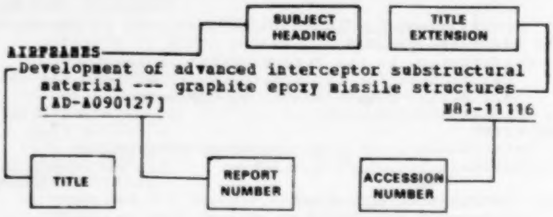
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Published results of the program of university research. Transportation research results
[PB81-210130] N81-34108
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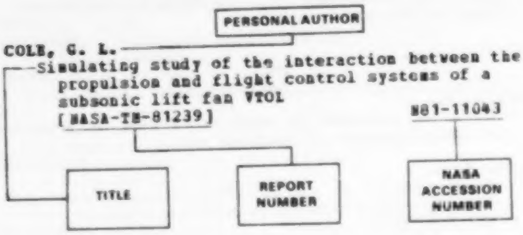
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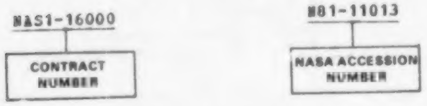

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NASA SP-7037(144)

A CUMULATIVE INDEX
TO
AERONAUTICAL ENGINEERING
A Continuing Bibliography

This Cumulative Index supersedes the indexes contained in supplements [SP-7037(132) through SP-7037(143)] published by NASA during 1981.

Scientific and Technical Information Branch 1982
National Aeronautics and Space Administration
Washington, DC

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INTRODUCTION

WHAT THIS CUMULATIVE INDEX IS

This publication is a cumulative index to the abstracts contained in NASA SP-7037(132) through NASA SP-7037(143) of *Aeronautical Engineering: A Continuing Bibliography*. NASA SP-7037 and its supplements have been compiled through the cooperative efforts of the American Institute of Aeronautics and Astronautics (AIAA) and the National Aeronautics and Space Administration (NASA). Entries prepared by the two contributing organizations are identified as follows:

1. NASA entries by their *STAR* accession numbers (N81-10000 series).
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This Cumulative Index includes a subject index, a personal author index, a corporate source index, a contract number index, and a report/accession number index.

HOW TO USE THE SUBJECT INDEX

Two types of cross-references appear in the subject index:

1. Use (U) references indicate that the subject term is not "postable," i.e., not a valid term, and the following term or terms are used instead. For example:

   AIRCRAFT PROTUBERANCES
   U PROTUBERANCES
   FLIGHT PERFORMANCE
   U FLIGHT CHARACTERISTICS

2. Narrower Term (NT) references refer the user to more specific headings in the same subject area, under which additional material on the subject may be found. For example:

   FLOW RESISTANCE
   NT AERODYNAMIC DRAG
   NT FRICTION DRAG
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In addition, a searcher may use the title or title and title extension in the index to narrow further his quest for particular items. This is because subject terms readily include more than one class of document. For example:

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illustrates a case where two references on different topics are listed under the same subject term.

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All personal authors used in the abstract-section citations in the individual Supplements appear in the index. Differences in transliteration schemes may require multiple searching of the index for variants of an author's name. For example:

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and
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AF 33(615)-71-C-1758
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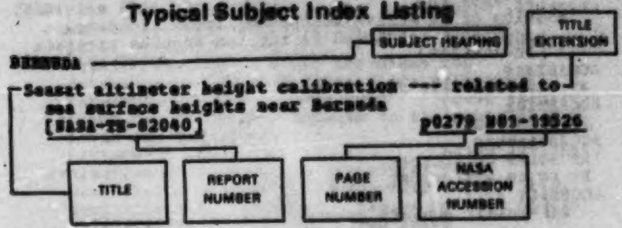

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US and USSR Military Aircraft and Missile
Aerodynamics 1970-1980. A selected, annotated
bibliography, volume 1
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International Symposium on Air Breathing Engines,
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Proceedings
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Precision flight path control in carrier landing approach - A case for integrated system design
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Guidance and Control Conference, Albuquerque, NM, August 19-21, 1981, Collection of Technical Papers
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Closed loop control systems: Aircraft. Citations from the NTIS data base
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SRDS Technical Program document. Fiscal year 1981. Research and Development approved projects
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Israel Annual Conference on Aviation and Astronautics, 21st, Tel Aviv and Haifa, Israel, February 28-March 1, 1979, Proceedings p0226 A81-24003

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Nederlandse Vereniging voor Luchtvaarttechniek, Yearbook 1979 p0232 A81-24938

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ICAM 'Manufacturing Cost/Design Guide' /MC/DG/ --- Integrated Computer Aided Manufacturing for aircraft systems
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The art of single-engine aircraft design
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[SAE PAPER 810629] p0524 A81-42781
Search and rescue methods and equipment. A bibliography with abstracts
[PB80-812837] p0023 N81-10026
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Adiabatic gas flow. Citations from the NTIS data base
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Head up displays. Citations from the International Aerospace Abstracts data base
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Gyrocompasses. Citations from the International Aerospace Abstracts data base
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Axial flow compressors. Citations from the Engineering Index data base
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Airfield pavement evaluation. Citations from the NTIS data base
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Axial flow compressors. Citations from the NTIS data base
[PB80-808603] p0031 N81-10091
Bibliography on aerodynamics of airframe/engine integration of high-speed turbine-powered aircraft, volume 1
[NASA-TM-81818] p0035 N81-11032
Synopsis on aircraft integrated data systems and engine health monitoring and maintenance
[DFVLR-MITT-80-08] p0075 N81-12063
Closed loop control systems: Aircraft. Citations from the NTIS data base
[PB80-813710] p0082 N81-12114
Airport noise. Citations from the NTIS data base
[PB80-813231] p0088 N81-12667
Aircraft maintenance. Citations from the International Aerospace Abstracts data base
[NTIS/PS-78/0839/3] p0125 N81-13917
Microwave landing systems. Citations from the Engineering Index data base
[PB80-810643] p0120 N81-13943
Microwave landing systems. Citations from the NTIS data base
[PB80-814835] p0120 N81-13949
Technological forecasting--aircraft design. Citations from the International Aerospace data base
[NASA-CR-163833] p0120 N81-13957
Maneuvering aircraft: Noise pollution and control. Citations from the NTIS data base
[PB80-815568] p0135 N81-14525
Bibliography of Supersonic Cruise Research (SCR) program from 1977 to mid-1980
[NASA-RP-1063] p0139 N81-14973
Remotely piloted vehicles. Citations from the International Aerospace abstracts data base
[NASA-CR-163864] p0142 N81-14996
Lightning. Citations from the International Aerospace abstracts data base
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Clean air turbulence. Citations from the International Aerospace Abstracts data base
[NASA-CR-163863] p0166 N81-15809
Collision avoidance systems. Citations from the NTIS data base
[PB80-815020] p0183 N81-16030
Air traffic control simulation models. Citations from the NTIS data base
[PB81-800104] p0237 N81-17837
Compilation of energy efficient concepts in advanced aircraft design and operations. Volume 2: Abstract data base
[AD-A098226] p0252 N81-18088
Scientific and Technical Information Output of the Langley Research Center, for calendar year 1976
[NASA-TM-82310] p0279 N81-19966
Support interference of wind tunnel models: A selective annotated bibliography
[NASA-TM-81909] p0335 N81-22085
NTT Annotated Bibliography
p0379 N81-22931
US and USSR Military Aircraft and Missile Aerodynamics 1970-1980. A selected, annotated bibliography, volume 1
[NASA-TM-81951] p0387 N81-23113
Published results of the program of university research. Transportation research results
[PB81-210130] p0641 N81-30106
Ames Research Center publications: A continuing bibliography, 1980
[NASA-TM-81308] p0641 N81-30130
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Bird strikes and aviation safety. Citations from the NTIS data base
[PB80-812944] p0024 N81-10027
Evaluation of the impact computer program as a linear design tool for bird resistant aircraft transparencies
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Evaluation of bird load models for dynamic analysis of aircraft transparencies
[AD-A092909] p0204 N81-16995
Validation of a bird substitute for development and qualification of aircraft transparencies
[AD-A097736] p0424 N81-24036
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Alternate T-38 transparency development. Part 1: Initial analysis and design
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[AD-A103262] p0638 N81-33197

BIRDS
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[AD-A089009] p0023 N81-10024
Bird flight and airplane flight --- instruments to measure air currents and flight characteristics
[NASA-TM-75777] p0138 N81-14962

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Helicopter model scale results of blade-vortex interaction impulsive noise as affected by tip modification
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Blade tip ceramic outer air seal for long life turbine engines
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The calculation of transonic blade tip flow at helicopter rotors
[DGLR PAPER 81-025] p0608 A81-47554
Tip geometry effects on the model helicopter rotor low frequency broadband noise
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Rotor redesign for a highly loaded 1800 ft/sec tip speed fan, 2
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An evaluation of a simplified near field noise model for supersonic helical tip speed propellers
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Pressure distribution computation on a nonlifting symmetrical helicopter blade in forward flight
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BLAST LOADS
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Nuclear blast response of airbreathing propulsion systems. Laboratory measurements with an operational J-85-5 turbojet engine
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Noise and noise abatement in fans and blowers: A review
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Calibration of an axial fan at various power settings for use on a quarter scale XC-8A air cushion model
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Some recent applications of high-lift computational methods at Boeing
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Airframe noise of a small model transport aircraft and scaling effects --- Boeing 747
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CONFERENCES
Standardization in military avionics systems architecture; Proceedings of the Seminar, Dayton, Ohio, November 28, 1975
p0050 A81-13167
Sensor Systems for the 80's Conference, Colorado Springs, Colo., December 2-4, 1980, Technical Papers
p0052 A81-13351
Specialists' Meeting on Helicopter Propulsion Systems, Williamsburg, Va., November 6-8, 1979, Technical Papers
p0104 A81-17501
International Air Transportation Conference, New Orleans, La., April 30-May 3, 1979, Proceedings. Volumes 1 & 2
p0110 A81-18051
Symposium on Internal Noise in Helicopters, University of Southampton, Southampton, England, July 17-20, 1979, Proceedings
p0150 A81-20051
Effect of load spectrum variables on fatigue crack initiation and propagation; Proceedings of the Symposium, San Francisco, Calif., May 21, 1979
p0172 A81-21730
Survival and Flight Equipment Association, Annual Symposium, 17th, Las Vegas, Nev., December 2-6, 1979, Proceedings
p0174 A81-22076
The 1980's - Payoff decade for advanced materials; Proceedings of the Twenty-fifth National Symposium and Exhibition, San Diego, Calif., May 6-8, 1980
p0181 A81-22636
Israel Annual Conference on Aviation and Astronautics, 21st, Tel Aviv and Haifa, Israel, February 28-March 1, 1979, Proceedings
p0226 A81-24003
Viscous flow drag reduction; Symposium, Dallas, Tex., November 7, 8, 1979, Technical Papers
p0238 A81-26501
Practical experiences with flow-induced vibrations; Proceedings of the Symposium, Universitaet Karlsruhe, Karlsruhe, West Germany, September 3-6, 1979
p0282 A81-27610
Radio Technical Commission for Aeronautics, Technical Symposium and Annual Assembly Meeting, Washington, D.C., November 20, 21, 1980, Proceedings
p0285 A81-28293
International Symposium on Air Breathing Engines, 5th, Bangalore, India, February 16-22, 1981, Proceedings
p0290 A81-29051
Structures, Structural Dynamics and Materials Conference, 22nd, Atlanta, Ga., April 6-8, 1981, Technical Papers. Part 1
p0300 A81-29377
Structures, Structural Dynamics and Materials Conference, 22nd, Atlanta, Ga., April 6-8, 1981, and AIAA Dynamics Specialists Conference, Atlanta, Ga., April 9, 10, 1981, Technical Papers. Part 2
p0303 A81-29428
Optics in metrology and quality assurance; Proceedings of the Seminar, Los Angeles, Calif., February 6, 7, 1980
p0350 A81-32504
Flight Simulation Technologies Conference, Long Beach, Calif., June 16-18, 1981, Technical Papers
p0414 A81-36554
Fatigue of fibrous composite materials; Proceedings of the Symposium, San Francisco, Calif., May 22, 23, 1979
p0418 A81-37126
Long focal length, high altitude standoff reconnaissance; Proceedings of the Seminar, San Diego, CA, July 29, 30, 1980
p0461 A81-39417
Guidance and Control Conference, Albuquerque, NM, August 19-21, 1981, Collection of Technical Papers
p0553 A81-44076
The roles of airline engineering and maintenance in 1981 --- summary for 26 January 1981 conference of ATLAS group
p0565 A81-45755
American Helicopter Society, Annual Forum, 37th, New Orleans, LA, May 17-20, 1981, Proceedings
p0571 A81-46603
Test methods and design allowables for fibrous composites; Proceedings of the Symposium, Dearborn, MI, October 2, 3, 1979
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Damping applications for vibration control; Proceedings of the Winter Annual Meeting, Chicago, IL, November 16-21, 1980
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Effect of service environment on composite materials
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Propulsion Controls, 1979 --- air breathing engine control
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Proceedings: Fourth Annual Workshop on Meteorological and Environmental Inputs to Aviation systems
[NASA-CP-2139] p0135 N81-14555
Computational Fluid Dynamics, volume 2
[VKI-LS-1980-5-VOL-2] p0164 N81-15310
The 17th JANNAF combustion meeting, volume 1
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Supersonic Cruise Research 1979, part 1
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La Recherche Aerospatiale, Bimonthly Bulletin no. 1980-2, March - April 1980
[ESA-TT-652] p0255 N81-18244
Advanced aerodynamics and active controls. Selected NASA research
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Noise exposure of civil aircarrier airplanes
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Noise exposure of civil aircarrier airplanes
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Shear layer instability noise produced by various
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[PNR-90018] p0088 N81-12825
Technological forecasting--aircraft design.
Citations from the International Aerospace data
base
[NASA-CR-163833] p0129 N81-13957
Noise and noise abatement in fans and blowers: A
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[DFVLR-FB-80-16] p0138 N81-14796
Curved centerline air intake for a gas turbine
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A guidance document on airport noise control
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Transport jet aircraft noise abatement in foreign
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Transport jet aircraft noise abatement in foreign
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February 28-March 1, 1979, Proceedings
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Conference, 22nd, Atlanta, Ga., April 6-8, 1981,
Technical Papers. Part 1
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Yearbook 1979
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Test methods and design allowables for fibrous
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Dearborn, MI, October 2, 3, 1979
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Israel Annual Conference on Aviation and Astronautics, 21st, Tel Aviv and Haifa, Israel, February 28-March 1, 1979, Proceedings
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Structures, Structural Dynamics and Materials Conference, 22nd, Atlanta, Ga., April 6-8, 1981, and AIAA Dynamics Specialists Conference, Atlanta, Ga., April 9, 10, 1981, Technical Papers. Part 2
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Supersonic Cruise Research 1979, part 2 --- airframe structures and materials, systems integration, economic analysis
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[VKI-PREPRINT-1980-10] p0021 N81-10011
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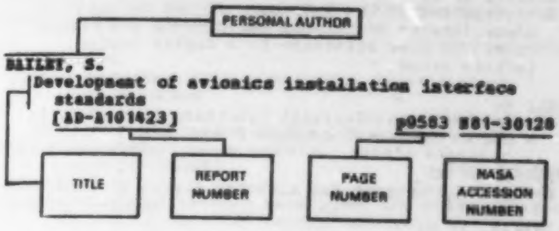

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Long focal length, high altitude standoff reconnaissance; Proceedings of the Seminar, San Diego, CA, July 29, 30, 1980
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Optics in metrology and quality assurance; Proceedings of the Seminar, Los Angeles, Calif., February 6, 7, 1980
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Practical experiences with flow-induced vibrations; Proceedings of the Symposium, Universitaet Karlsruhe, Karlsruhe, West Germany, September 3-6, 1979
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Bibliography on aerodynamics of airframe/engine integration of high-speed turbine-powered aircraft, volume 1
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Effect of load spectrum variables on fatigue crack initiation and propagation; Proceedings of the Symposium, San Francisco, Calif., May 21, 1979
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International Symposium on Air Breathing Engines, 5th, Bangalore, India, February 16-22, 1981, Proceedings
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T

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Cruise missile engine program contract data requirements list sequence number 95. Qualification test report. Volume 39: Vibration and mission simulation testing on engine 828. XF-107-WR-400 cruise missile engine
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Fatigue of fibrous composite materials; Proceedings of the Symposium, San Francisco, Calif., May 22, 23, 1979
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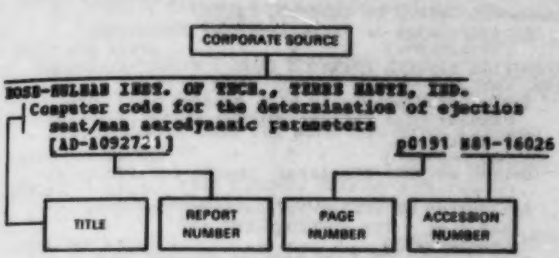
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Handbook of aircraft noise metrics
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CENTRE TECHNIQUE DES INDUSTRIES MECANIQUES, SENLIS (FRANCE).
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Microbursts as an aviation wind shear hazard
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CIVIL AERONAUTICS BOARD, WASHINGTON, D.C.
Airport activity statistics of certificated route air carriers, calendar year 1979
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Airport activity statistics of certificated route air carriers
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Helicopter Fatigue: A civil view
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CLEMSON UNIV., S.C.
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Learning guide for the terminal configured vehicle advanced guidance and control system mode select panel
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Ozone contamination in aircraft cabins - Results from GASP data and analyses
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Trailing edge noise from hovering rotors
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DE HAVILLAND AIRCRAFT CO. OF CANADA LTD., DOWNSVIEW (ONTARIO).
Static tests of the J97 powered, external augmenter V/STOL wind tunnel model
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DEFENCE RESEARCH ESTABLISHMENT ATLANTIC, DARTMOUTH (NOVA SCOTIA).
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DEPARTEMENT D'ETUDES ET DE RECHERCHES EN TECHNOLOGIE SPATIALE, TOULOUSE (FRANCE).
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A unified approach to the mass balancing of rotating flexible shafts
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Application of transonic potential calculations to aircraft and wind tunnel configurations
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Characteristics of a digital filter for a precision DME system in microwave landing systems
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[AIAA PAPER 81-1963] p0618 A81-48607
Laboratory study of efficient add-on treatments
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[AIAA PAPER 81-1969] p0619 A81-48618
Ground effects on aircraft noise for a wide-body
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Bibliography on aerodynamics of airframe/engine
integration of high-speed turbine-powered
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Wind-tunnel test of an articulated helicopter
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Economic evaluation of flying-qualities design
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Assessment of ground effects on the propagation
of aircraft noise: The T-38A flight experiment
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Aerodynamic side-force alleviator means
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Investigation of convergent-divergent nozzles
applicable to reduced-power supersonic cruise
aircraft
[NASA-TP-1766] p0139 N81-14972
Bibliography of Supersonic Cruise Research (SCR)
program from 1977 to mid-1980
[NASA-RP-1063] p0139 N81-14973
Leading-edge deflection optimization for a
highly swept arrow wing configuration
[NASA-TP-1777] p0139 N81-14974
Wind-tunnel measurements and comparison with
flight of the boundary layer and heat transfer
on a hollow cylinder at Mach 3
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Simulator study of conventional general aviation
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Effects of angle of attack and ventral fin on
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Effects of sidewall geometry on the installed
performance of nonaxisymmetric
convergent-divergent exhaust nozzles
[NASA-TP-1771] p0185 N81-15976
Effect of wing location and strakes on stability
and control characteristics of a monoplanar
circular missile with low-profile tail fins at
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[NASA-TM-81870] p0186 N81-15978
A flight investigation of performance and loads
for a helicopter with RC-SC2 main-rotor blade
sections
[NASA-TM-81898] p0186 N81-15982
Some wake-related operational limitations of
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[NASA-TM-81920] p0186 N81-15985
Use of constrained optimization in the
conceptual design of a medium-range subsonic
transport
[NASA-TP-1762] p0193 N81-16030
Large-scale carbon fiber tests
[NASA-TM-80218] p0198 N81-16137
Current and projected use of carbon composites
in United States aircraft
p0198 N81-16106
The 17th JANNAF combustion meeting, volume 1
[NASA-TM-82238] p0200 N81-16253
Experiments using electronic display information
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Supersonic Cruise Research 1979, part 1
[NASA-CP-2108-PT-1] p0243 N81-17981
Overview of the Langley subsonic research effort
on SCR configuration
p0243 N81-17982
Results of a low-speed wind tunnel test of the
MDC 2.2M supersonic cruise aircraft
configuration

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The prediction of pressure distributions on an
arrow-wing configuration including the effect
of camber, twist, and a wing fin
p0243 N81-17984
Supersonic wings with significant leading-edge
thrust at cruise
p0244 N81-17990
Development of SCR Aircraft takeoff and landing
procedures for community noise abatement and
their impact on flight safety
p0245 N81-17994
Effects of nozzle design on the noise from
supersonic jets
p0246 N81-18001
Supersonic Cruise Research 1979, part 2
[NASA-CP-2108-PT-2] p0246 N81-18005
Supersonic cruise research aircraft structural
studies: Methods and results
p0246 N81-18008
An assessment of buffer strips for improving
damage tolerance
p0247 N81-18009
Risk to the public from carbon fibers released
in civil aircraft accidents
[NASA-SP-448] p0254 N81-18096
Ceramic and coating applications in the hostile
environment of a high temperature hypersonic
wind tunnel
[NASA-TM-81931] p0254 N81-18199
Geometric methods in computational fluid dynamics
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Structural tests on space shuttle thermal
protection system constructed with
nondensified and densified LI 900 and LI 2200
tile
[NASA-TM-81903] p0257 N81-18410
A crack-closure model for predicting
fatigue-crack growth under aircraft spectrum
loading
[NASA-TM-81941] p0257 N81-18412
Advanced aerodynamics and active controls.
Selected NASA research
[NASA-CP-2172] p0259 N81-19001
Langley Research Center contributions in
advancing active control technology
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Status and future plans of the Drones for
Aerodynamic and Structural Testing (DAST)
program
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In flight direct strike lightning research
p0259 N81-19005
Investigation of powered nacelles on a high
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The RRT Horizontal Tails Investigation and the
RRT Lateral Controls Investigation
p0260 N81-19009
Leading edge vortex flaps for drag reduction
[NASA-CASE-LAR-12750-1] p0261 N81-19016
Aeropropulsive characteristics of twin
nonaxisymmetric vectoring nozzles installed
with forward-swept and aft-swept wings
[NASA-TP-1778] p0261 N81-19019
Effect of wing-transition location and slotted
and unslotted flaps on aerodynamic
characteristics of a fighter model at high
subsonic speeds
[NASA-TM-X-1849] p0262 N81-19024
Wind-tunnel investigation at Mach numbers from
0.25 to 1.01 of a transport configuration
designed to cruise at near-sonic speeds
[NASA-TM-X-2622] p0262 N81-19025
The 1980 Aircraft Safety and Operating Problems,
part 1
[NASA-CP-2170-PT-1] p0264 N81-19035
Test results of flight guidance for fuel
conservative descents in a time-based metered
air traffic environment
p0264 N81-19036
A pilot's subjective analysis of a Cockpit
Display of Traffic Information (CDTI)
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Guidance and control system research for
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Operational considerations in utilization of
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In-flight direct-strike lightning research
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The 1980 Aircraft Safety and Operating Problems,
part 2
[NASA-CP-2170-PT-2] p0267 N81-19056
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NASA/FAA general aviation crash dynamics program
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Current research in aircraft tire design and
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Review of antiskid and brake dynamics research
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Studies of some unconventional systems for
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Recent progress toward predicting aircraft
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The NASA digital VGH program, early results
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Evaluation of emergency-locator-transmitter
performance in real and simulated crash tests
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Sources, control, and effects of noise from
aircraft propellers and rotors
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NASA programs in aircraft noise prediction
p0269 N81-19074
Compensating linkage for main rotor control
[NASA-CASE-LAR-11797-1] p0270 N81-19087
Preliminary wind-tunnel investigation of the
effects of engine nacelles on a transport
configuration with high lift drag ratios to a
Mach number of 1.00
[NASA-TM-82312] p0272 N81-19099
Thrust augmented spin recovery device
[NASA-CASE-LAR-11970-2] p0275 N81-19130
Scientific and Technical Information Output of
the Langley Research Center, for calendar year
1976
[NASA-TM-82310] p0279 N81-19964
Aerodynamic characteristics of a hypersonic
cruise aircraft concept with wing-mounted
propulsion systems at Mach numbers of 2.96,
3.96 and 4.63
[NASA-TM-81937] p0329 N81-20025
A computer technique for detailed analysis of
mission radius and maneuverability
characteristics of fighter aircraft
[NASA-TP-1837] p0329 N81-20026
A pilot training manual for the terminal
configured vehicle electronic horizontal
situation indicator
[NASA-TM-81959] p0330 N81-20044
Operational considerations in utilization of
microwave landing system approach and landing
guidance
[NASA-TM-81945] p0331 N81-20050
An analytical study of the longitudinal response
of airplanes to positive wind shear
[NASA-TP-1765] p0335 N81-20082
Operating characteristics of the Langley Mach 7
Scramjet Test Facility
[NASA-TM-81929] p0335 N81-20083
Support interference of wind tunnel models: A
selective annotated bibliography
[NASA-TM-81909] p0335 N81-20084
Comments on settling chamber design for quiet,
blowdown wind tunnels
[NASA-TM-81948] p0335 N81-20085
Charts for determining potential minimum
sonic-boom overpressures for supersonic cruise
aircraft
[NASA-TP-1820] p0337 N81-21016

Fluid mechanics mechanisms in the stall process of helicopters
[NASA-TM-81956] p0338 N81-21027
Recent progress towards predicting aircraft ground handling performance
[NASA-TM-81952] p0339 N81-21044
Subjective field study of response to impulsive helicopter noise
[NASA-TP-1833] p0345 N81-21873
Sources, control, and effects of noise from aircraft propellers and rotors
[NASA-TM-81971] p0345 N81-21904
Pressure and force data for a flat wing and a warped conical wing having a shockless recompression at Mach 1.62
[NASA-TP-1759] p0372 N81-22016
Analytical study of the cruise performance of a class of remotely piloted, microwave-powered, high-altitude airplane platforms
[NASA-TM-81969] p0374 N81-22040
Description of 0.186-scale model of high-speed duct of national transonic facility
[NASA-TM-81949] p0377 N81-22061
Airframe noise of a small model transport aircraft and scaling effects
[NASA-TP-1858] p0380 N81-22032
Two-dimensional aerodynamic characteristics of the NACA 0012 airfoil in the Langley 8 foot transonic pressure tunnel
[NASA-TM-81927] p0385 N81-23036
Transonic flutter study of a wind-tunnel model of an arrow-wing supersonic transport
[NASA-TM-81962] p0388 N81-23071
Transonic flutter and gust-response tests and analyses of a wind-tunnel model of a torsion free wing airplane
[NASA-TM-81961] p0388 N81-23072
Description of recent changes in the Langley 6- by 28-inch transonic tunnel
[NASA-TM-81947] p0391 N81-23096
Mean-flow and turbulence measurements in the vicinity of the trailing edge of an NACA (63 sub 1)-012 airfoil
[NASA-TP-1845] p0392 N81-23410
An airport community noise-impact assessment model
[NASA-TM-80198] p0393 N81-23713
Lateral attenuation of high-by-pass ratio engined aircraft noise
[NASA-TM-81968] p0394 N81-23862
Design and experimental results for a natural-laminar-flow airfoil for general aviation applications
[NASA-TP-1861] p0423 N81-24022
Flight evaluation of a simple total energy-rate system with potential wind-shear application
[NASA-TP-1854] p0427 N81-24058
Velocity vector control system augmented with direct lift control
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Evaluation of turbulence reduction devices for the Langley 8-foot Transonic Pressure Tunnel
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Estimation of fan pressure ratio requirements and operating performance for the National Transonic Facility
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Tire/wheel concept
[NASA-CASE-LAR-11695-2] p0437 N81-24443
Static and yawed-rolling mechanical properties of two type 7 aircraft tires
[NASA-TP-1863] p0437 N81-24471
Airport noise impact reduction through operations
[NASA-TM-81970] p0438 N81-24855
Application of a flight test and data analysis technique to flutter of a drone aircraft
[NASA-TM-83136] p0441 N81-25066
Research related to variable sweep aircraft development
[NASA-TM-83121] p0441 N81-25067
Prediction of transonic flutter for a supercritical wing by modified strip analysis and comparison with experiment
[NASA-TM-83126] p0445 N81-25432
Acoustic facilities for human factors research at NASA Langley Research Center: Description and operational capabilities
[NASA-TM-81975] p0446 N81-25765
A procedure for designing forebodies with constraints on cross-section shape and axial area distribution
[NASA-TP-1881] p0483 N81-26076
A learning guide for the terminal configured vehicle electronic horizontal situation indicator
[NASA-TM-83128] p0484 N81-26083
Cooling system for high speed aircraft
[NASA-CASE-LAR-12406-1] p0485 N81-26116
Flight test results of an active flutter suppression system installed on a remotely piloted research vehicle
[NASA-TM-83132] p0486 N81-26118
Simplified design point performance model of a dry turbofan engine cycle
[NASA-TM-83112] p0490 N81-26148
Pitch attitude stabilization system utilizing engine pressure ratio feedback signals
[NASA-CASE-LAR-12562-1] p0490 N81-26152
Qualitative comparison of calculated turbulence responses with wind-tunnel measurements for a DC-10 derivative wing with an active control system
[NASA-TM-83144] p0491 N81-26496
Structures and Dynamics Division research and technology plans, fiscal year, 1981
[NASA-TM-83137] p0491 N81-26497
Thunderstorm hazards flight research: Storm hazards 1980 overview
[NASA-TM-81974] p0493 N81-27062
Wingtip vortex turbine
[NASA-CASE-LAR-12544-1] p0496 N81-27096
A digital program for calculating the interaction between flexible structures, unsteady aerodynamics and active controls
[NASA-TM-80040] p0498 N81-27115
Wind-tunnel evaluation of NASA developed control laws for flutter suppression on a DC-10 derivative wing
[NASA-TM-83143] p0499 N81-27540
Explosively activated egress area
[NASA-CASE-LAR-12624-1] p0546 N81-29107
Effect of display size on utilization of traffic situation display for self-spacing task
[NASA-TP-1885] p0546 N81-29109
Evaluation of Microwave Landing System (MLS) effect on the delivery performance of a fixed-path metering and spacing system
[NASA-TP-1844] p0546 N81-29111
US and USSR Military Aircraft and Missile Aerodynamics 1970-1980. A selected, annotated bibliography, volume 1
[NASA-TM-81951] p0547 N81-29119
Considerations for the installation of honeycomb and screens to reduce wind-tunnel turbulence
[NASA-TM-81868] p0550 N81-29137
A rectangular rod-wall sound shield
[NASA-CASE-LAR-12883-1] p0550 N81-29138
Guide for users of the National Transonic Facility
[NASA-TM-83124] p0550 N81-29139
Effect of simulated in-flight thrust reversing on vertical-tail loads of F-18 and F-15 airplane models
[NASA-TP-1890] p0579 N81-30086
Wing-alone aerodynamic characteristics for high angles of attack of supersonic speeds
[NASA-TP-1889] p0579 N81-30087
Computer analysis of flow perturbations generated by placement of choke bumps in a wind tunnel
[NASA-TP-1892] p0579 N81-30088
The use of interpractive graphic displays for interpretation of surface design parameters
[NASA-TM-81963] p0581 N81-30110
Behavior of aircraft antiskid braking systems on dry and wet runway surfaces: Hydromechanically controlled system
[NASA-TP-1877] p0581 N81-30112
Carbon/graphite composite material study. 3: Agency program activities. National Aeronautics and Space Administration (NASA)
p0585 N81-30189
Carbon/graphite composite material study, appendix A and appendix B
p0585 N81-30190
Some experiences with active control of aeroelastic response
[NASA-TM-83179] p0587 N81-30069
A method for obtaining reduced-order control laws for high-order systems using optimization

techniques
[NASA-TP-1876] p0589 N81-30851
Curved-flow, rolling-flow, and oscillatory pure-yawing wind-tunnel test methods for determination of dynamic stability derivatives
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Estimation of dynamic stability parameters from drop model flight tests
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Applications of dynamic stability parameters to problems in aircraft dynamics
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Wall interference effects: Status review
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Report of the panel on fluid dynamics
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Report of the wind tunnel/flight correlation panel
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High Reynolds number research requirements for space vehicle design
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Report of the panel on theoretical aerodynamics
p0593 N81-31152
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Aeroelastic instability stoppers for wind-tunnel models
[NASA-CASE-LAR-12458-1] p0601 N81-31230
MLS antenna locations for the deHavilland DASH 7 aircraft
[NASA-TM-83195] p0602 N81-31418
Effect of sweep and aspect ratio on the longitudinal aerodynamics of a spanloader wing in and out of ground effect
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Solar powered aircraft
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User's manual for a computer program to calculate discrete frequency noise of conventional and advanced propellers
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Analysis of the performance of the drive system and diffuser of the Langley unitary plan wind tunnel
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Flight test of a pure-tone acoustic source
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Inlet flow distortion in turbomachinery
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Calculated and experimental data for a 118-mm bore roller bearing to 3 million DN
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Performance of computer-optimized tapered-roller bearings to 2.4 million DN
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Dynamic characteristics of a high-speed rotor with radial and axial foil-bearing supports
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Lubrication of rolling element bearings
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Scale effects on turbulent boundary layer development and flow separation around V/STOL inlets at high incidence
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Three-dimensional turbulent boundary layer development and separation in V/STOL engine inlets at incidence with small-cross flow and curvature influences
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Ozone contamination in aircraft cabins - Results from GASP data and analyses
[AIAA PAPER 81-0305] p0164 A81-20740
An analytical approach to airfoil icing
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Mean rotor wake characteristics of an aerodynamically loaded 0.5 m diameter fan
[AIAA PAPER 81-0208] p0168 A81-20830
Icing tunnel tests of a glycol-exuding porous leading edge ice protection system on a general aviation airfoil
[AIAA PAPER 81-0405] p0168 A81-20837
Numerical techniques in linear duct acoustics - A status report
[ASME PAPER 80-WA/NC-2] p0170 A81-21120
Stability of large horizontal-axis axisymmetric wind turbines
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New interpretations of shock-associated noise with and without screech
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Core noise measurements from a small, general aviation turbofan engine
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Effect of a semi-annular thermal acoustic shield on jet exhaust noise
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Effect of facility variation on the acoustic characteristics of three single stream nozzles
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NASA's activities in the conservation of strategic aerospace materials
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The future of aeronautical propulsion
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Flow separation in inlets at incidence angles
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Superhybrid composite blade impact studies
[ASME PAPER 81-GT-24] p0311 A81-29940
Development of a low NO/x/ lean premixed annular combustor
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NASA research in aeropropulsion
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Low NO/x/ and fuel flexible gas turbine combustors
[ASME PAPER 81-GT-99] p0315 A81-30006
Design and development of the combustor inlet diffuser for the NASA/GE energy efficient engine
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Supersonic stall flutter of high-speed fans
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Effect of time-dependent flight loads on turbofan engine performance deterioration
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High temperature electronic requirements in aeropropulsion systems
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Factors which influence the behavior of turbofan forced mixer nozzles
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Improved components for engine fuel savings
[SAE PAPER 801116] p0395 A81-34152
Performance deterioration of commercial high-bypass ratio turbofan engines
[SAE PAPER 801118] p0396 A81-34154
A status report on the Energy Efficient Engine Project
[SAE PAPER 801119] p0396 A81-34155
The NASA high-speed turboprop program
[SAE PAPER 801120] p0396 A81-34156
Description of the warm core turbine facility and the warm annular cascade facility recently installed at NASA Lewis Research Center
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Loss model for off-design performance analysis of radial turbines with pivoting-vane, variable-area stators
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An experimental evaluation of the performance deficit of an aircraft engine starter turbine
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Composite wall concept for high-temperature turbine shrouds - Heat transfer analysis
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Future challenges in V/STOL flight propulsion control integration
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Some advantages of methane in an aircraft gas turbine
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Reverse thrust performance of the QCSEE variable pitch turbofan engine
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Comparison of predicted engine core noise with proposed FAA helicopter noise certification requirements
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A nonlinear propulsion system simulation technique for piloted simulators
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Application of unsteady airfoil theory to rotary wings
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Improved combustor durability - Segmented approach with advanced cooling techniques
[AIAA PAPER 81-1354] p0501 A81-40836
Effect of a part-span variable inlet guide vane on the performance of a high-bypass turbofan engine
[AIAA PAPER 81-1362] p0502 A81-40842
Small gas-turbine combustor study - Fuel injector evaluation
[AIAA PAPER 81-1388] p0502 A81-40857
Selected results from combustion research at the Lewis Research Center
[AIAA PAPER 81-1392] p0503 A81-40859
JT9D performance deterioration results from a simulated aerodynamic load test
[AIAA PAPER 81-1588] p0507 A81-40963
Turbine bypass engine - A new supersonic cruise propulsion concept
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The supersonic fan engine - An advanced concept in supersonic cruise propulsion
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The E3 combustors - Status and challenges
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Zero-length inlets for subsonic V/STOL aircraft
[AIAA PAPER 81-1396] p0515 A81-42186
Factors influencing the predicted performance of advanced propeller designs
[AIAA PAPER 81-1564] p0516 A81-42210
Low and high speed propellers for general aviation - Performance potential and recent wind tunnel test results
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An overview of general aviation propulsion research programs at NASA-Lewis Research Center
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.

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NATIONAL PHYSICAL LAB., TEDDINGTON (ENGLAND).

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NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA (ONTARIO).

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Airfield pavement evaluation. Citations from the NTIS data base [PB80-812860] p0030 N81-10083

Closed loop control systems: Aircraft. Citations from the NTIS data base [PB80-813710] p0082 N81-12114

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NATIONAL TRANSPORTATION SAFETY BOARD, WASHINGTON, D. C.

Annual review of aircraft accident data, U.S. General aviation calendar year 1978 [PB80-201916] p0024 N81-10028

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Aircraft accident reports. Brief format, US civil aviation: Issue no. 11, 1979 accidents [NTSB-BA-80-8] p0075 N81-12053

Briefs of accidents involving commuter air carriers and on-demand air taxi operations, U.S. General Aviation 1978 [PB81-101701] p0141 N81-14987

Commuter airline safety [PB81-104267] p0141 N81-14988

Briefs of fatal accidents involving weather as a cause/factor, US General Aviation, 1978 [PB81-110827] p0192 N81-16028

Listing of accidents/incidents by aircraft make and model, United States Civil Aviation, 1978 [PB81-110280] p0205 N81-16998

Aircraft Accident Report: Air Pennsylvania 501, Piper PA-31-350, N5HS Philadelphia, Pennsylvania, July 25, 1980 [PB81-910401] p0269 N81-19077

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NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER, BETHESDA, MD.

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NEW ENGLAND RESEARCH APPLICATION CENTER, STORRS, CONN.
Adiabatic gas flow. Citations from the NTIS data base
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Head up displays. Citations from the NTIS data base
[PB80-809064] p0026 N81-10050
Gyrocompasses. Citations from the International Aerospace Abstracts data base
[NASA-CR-163675] p0028 N81-10065
Axial flow compressors. Citations from the Engineering Index data base
[PB80-808611] p0029 N81-10076
Axial flow compressors. Citations from the NTIS data base
[PB80-808603] p0031 N81-10441
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Heat transfer from a row of impinging jets to concave cylindrical surfaces
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Three-dimensional turbulent boundary layer development and separation in V/STOL engine inlets at incidence with small-cross flow and curvature influences
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Aircraft maintenance. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0859/3] p0125 N81-13917
Technological forecasting--aircraft design. Citations from the International Aerospace data base
[NASA-CR-163833] p0129 N81-13957
Remotely piloted vehicles. Citations from the International Aerospace abstracts data base
[NASA-CR-163864] p0142 N81-14996
Lightning. Citations from the International Aerospace abstracts data base
[NASA-CR-163857] p0146 N81-15648
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[NASA-CR-163863] p0146 N81-15649
NEW YORK UNIV., N. Y.
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Prediction of supersonic store separation characteristics including fuselage and stores of noncircular cross section. Volume 1: Theoretical methods and comparisons with experiment
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Prediction of supersonic store separation characteristics including fuselage and stores of noncircular cross section. Volume 3: Appendices A and B. Details of program 1
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A slot allocation model for high-density airports
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Centrifugal compressors for small aero and automotive gas turbine engines
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High contrast CRT module
[AD-A097727] p0437 N81-24360
NORTH ATLANTIC TREATY ORGANIZATION, BODO (NORWAY).
Seat pack for fighter aircraft operating on the NATO Northern Flank
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Reliability validation of systems for life-critical applications
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NORTHROP CORP., HAWTHORNE, CALIF.
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NORTHROP SERVICES, INC., MOFFETT FIELD, CALIF.
Clear air turbulence - An airborne alert system
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NORTHWESTERN UNIV., EVANSTON, ILL.
Transport jet aircraft noise abatement in foreign countries: Growth, structure, impact. Volume 1: Europe, July 1980
[NASA-CR-152356] p0220 N81-17623
Transport jet aircraft noise abatement in foreign countries: Growth, structure, impact. Volume 2: Pacific basin, August 1980
[NASA-CR-152357-VOL-2] p0220 N81-17624

NOTRE DAME UNIV., IND.
Alternatives for jet engine control
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A Matrix Approach to Biological Investigation of Synthetic Fuels
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OAK RIDGE Y-12 PLANT, TENN.
F-111 windscreen machining
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OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, LECLERC (FRANCE).
Test and analyses of an active flutter suppression system on an FFDL model of YF17
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OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, PARIS (FRANCE).
Review of theoretical and experimental results on three dimensional turbulent wakes and boundary layers
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Experimental study of the interaction between the wing of a subsonic aircraft and a nacelle of a high by-pass ratio engine
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[ESA-TT-652] p0255 N81-18244
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OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, D. C.
Aeronautics and Space Report of the President, 1979 activities
p0089 N81-12956

OFFICE OF NAVAL RESEARCH, ARLINGTON, VA.
Dynamic characteristics of a high-speed rotor with radial and axial foil-bearing supports
[ASME PAPER 80-C2/LUB-35] p0117 A81-18[illegible]

OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D. C.
Assessment of the impact of advanced air-transport technology
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OHIO STATE UNIV., COLUMBUS.
An analytical approach to airfoil icing
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Airborne antenna pattern code: User's manual
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OHIO UNIV., ATHENS.
DC-to-DC power supply for light aircraft flight testing
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Investigation of air transportation technology at Ohio University, 1980
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Results of a Loran-C flight test using an absolute data reference
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VLF P-static noise reduction in aircraft. Volume 2: Recommended action
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OKLAHOMA STATE UNIV., STILLWATER.
Prediction of swirling reacting flow in ramjet combustors
[AIAA PAPER 81-1485] p0506 A81-[illegible]
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OLD DOMINION UNIV., NORFOLK, VA.
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Wind-tunnel studies of advanced cargo aircraft concepts
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OREGON STATE UNIV., CORVALLIS.
Application of linear quadratic control in reduction of aerodynamic forces on aircraft
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OXFORD UNIV. (ENGLAND).
A discussion document on the thermal design of force balances for cryogenic wind tunnels
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P

PACER SYSTEMS, INC., ARLINGTON, VA.
Study of heliport airspace and real estate requirements
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Study of helicopter performance and terminal instrument procedures
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PAN AMERICAN WORLD AIRWAYS, INC., JAMAICA, N. Y.
Performance deterioration: An airline perspective
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PARKER (LEE W.), INC., CONCORD, MASS.
Airborne lightning warning systems: A survey
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PEAT, MARWICK, MITCHELL AND CO., SAN FRANCISCO, CALIF.
Aircraft towing feasibility study
[DOE/CS-50069/1] p0074 N81-12051
Responses to comments of Air Transport Association of America on aircraft towing feasibility study
[PB81-025630] p0638 N81-33201
PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
Structure and decay characteristics of turbulence in the near- and far-wake of a moderately loaded compressor rotor-blade
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Coupling of unsteady lift to acoustic duct modes in an axial flow fan
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Investigation of air solubility in Jet A fuel at high pressures
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End wall flows in rotors and stators of a single stage compressor
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PENNSYLVANIA TRANSPORTATION INST., UNIVERSITY PARK.
Analysis of turbulent boundary layer on cascade and rotor blades of turbomachinery
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Unsteady pressure distributions on airfoils in cascade
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PENNSYLVANIA UNIV., PHILADELPHIA.
Mechanisms of damage accumulation in time-dependent cyclic deformation
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PERCEPTRONICS, INC., WOODLAND HILLS, CALIF.
Analysis and modeling of information handling tasks in supervisory control of advanced aircraft
[AD-A092906] p0211 N81-17061
PISA UNIV. (ITALY).
The fatigue crack growth under variable amplitude loading in built-up structures
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Fatigue behavior of helicopter dynamic components under constant amplitude and spectrum loading
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POITIERS UNIV. (FRANCE).
The application of UV spectroscopy to the quantitative analysis of nitrogen oxide
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POLITECNICO DI MILANO (ITALY).
Evaluation of section properties for hollow composite beams
[PAPER-88-35] p0031 N81-10454
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PRATT AND WHITNEY AIRCRAFT, EAST HARTFORD, CONN.
Progress with variable cycle engines
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PRATT AND WHITNEY AIRCRAFT, WEST PALM BEACH, FLA.
Disk residual life studies. Part 2: TF30 10th-stage compressor disk (INCOLOY 901)
[AD-A089524] p0029 N81-10076
Disk residual life studies. Part 1: F100 1st-stage turbine disk (IN100)
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Advanced industrial gas turbine technology readiness demonstration
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PRATT AND WHITNEY AIRCRAFT GROUP, EAST HARTFORD, CONN.
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Propulsion controls
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blade performance improvement
[NASA-CR-165220] p0214 N81-17080
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 1: Design
layouts
[NASA-CR-159819-VOL-1] p0214 N81-17081
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 2:
Tabulated aeroynamic data book 1
[NASA-CR-159819-VOL-2-BK-1] p0214 N81-17082
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 2:
Tabulated aerodynamic data book 2
[NASA-CR-159819-VOL-2-BK-2] p0214 N81-17083
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 2:
Tabulated aerodynamic data book 3
[NASA-CR-159819-VOL-2-BK-3] p0214 N81-17084
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 3:
Graphical data book 1
[NASA-CR-159819-VOL-3-BK-1] p0214 N81-17085
Model aerodynamic test results for two variable
cycle engine coannular exhaust systems at
simulated takeoff and cruise conditions.
Comprehensive data report. Volume 3:
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[AD-A093057] p0215 N81-17091
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Design, durability and low cost processing
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FLA.
Future challenges in V/STOL flight propulsion
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PRINS MAURITS LAB. TNO, RIJSWIJK (NETHERLANDS).
Minimum ignition energy of F40 aircraft fuel/air
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PURDUE UNIV., LAFAYETTE, IND.
Factors influencing the predicted performance of
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Wind tunnel corrections for high angles of attack: A brief review of recent UK work
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QUINBY (GILBERT F.), FORT WASHINGTON, PA.
An assessment of General Aviation utilization of advanced avionics technology
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Proceedings of the Public Workshop on Alternative Separation Concepts: Presentations, Discussions and Recommendations
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R AND D ASSOCIATES, MARINA DEL REY, CALIF.
Aircraft NO/x/ emissions and stratospheric ozone reductions - Another look
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Chromatographic separation of conventional and experimental fuels
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Exploratory study of hazard mitigation and research in the air transport system
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REGISTRO AERONAUTICO ITALIANO, ROME.
Overview of all civil aviation engine certification/demonstration requirements and rationale, i.e., FAA, CAA, etcetera
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Composite structural materials
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[NASA-CR-164634] p0541 N81-28176
RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
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[NASA-CR-165675] p0537 N81-28078
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High current power controller
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ROCKWELL INTERNATIONAL CORP., CEDAR RAPIDS, IOWA.
Delta electrical load analysis C-141B JACC/CP Aircraft
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ROCKWELL INTERNATIONAL CORP., COLUMBUS, OHIO.
A study of a VSTOL thrusting ejector in low speed flight, volume 1
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ROCKWELL INTERNATIONAL CORP., DALLAS, TEX.
Stress analysis of aircraft modifications (C-141B Aircraft). Joint Airborne Communications Center/Command Post (JACC/CP) provisions
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ROCKWELL INTERNATIONAL CORP., EL SEGUNDO, CALIF.
Weapon bay cavity noise environments, data correlation and prediction for the B-1 aircraft
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[AD-A094350] p0250 N81-18420
ROLLS-ROYCE LTD., BRISTOL (ENGLAND).
Metallurgical aspects of materials processing and manufacturing for aero-engine components
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Multi-mission STOVL with vectored thrust engines
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ROLLS-ROYCE LTD., DERBY (ENGLAND).
Quantitative thermography in aero-engine research and development

[PNR-90021] p0029 N81-10975

System to measure the pressure distribution on fan aerofoil surfaces during flutter conditions
[PNR-90013] p0072 N81-12029

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A resin injection technique for the fabrication of aero engine composite components
[PNR-90024] p0131 N81-14004

Exhaust noise in flight: The role of acoustic installation effects
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The measurement of aero gas turbine noise
[PNR-90032] p0138 N81-14795

On the influence of steady state temperature and pressure distortion on the flow characteristics in an installed multistage jet engine compressor
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The mechanical testing of compressors and turbines for aircraft gas turbine engines
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Programmes for military engines with cost objectives
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A United Kingdom view on future fuels
[PNR-90068] p0602 N81-31398

ROLLS-ROYCE LTD., LONDON (ENGLAND).

Performance retention of the RB211 powerplant in service
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ROSE-HULMAN INST. OF TECH., TERRE HAUTE, IND.

Computer code for the determination of ejection seat/man aerodynamic parameters
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ROYAL AIR FORCE INST. OF AVIATION MEDICINE, FARNBOROUGH (ENGLAND).

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ROYAL AIRCRAFT ESTABLISHMENT, BEDFORD (ENGLAND).

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Wind-tunnel measurement of aerodynamic derivatives using flexible-sting rigs
p0591 N81-31110

ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH (ENGLAND).

An investigation of scale effects on the transonic flow over swept wings. Part 2: Measurements on a model of a variable-sweep strike-fighter configuration
[ARC-R/M-3842-PT-2] p0021 N81-10010

Flow measurements in the wake of a wing fitted with a leading-edge root extension (strake)
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Contributions to the United Kingdom microwave landing system research and development program, 1974 to 1978. Volume 1
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Contributions to the United Kingdom microwave landing system research and development program, 1974 to 1978. Volume 2
[RAE-TR-79052-VOL-2] p0026 N81-1

Contributions to the United Kingdom microwave landing system research and development program, 1974 to 1978. Volume 3
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The intelligibility of speech presented over the telephones of the Mk 4 flying helmet
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Digital spectral analysis: A guide based on experience with aircraft vibration
[RAE-TR-81014] p0605 N81-3

ROYAL MILITARY COLL. OF SCIENCE, SHRIVENHAM (ENGLAND).

Generalized dynamic stability for linearized yawing motion
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ROYAL NETHERLANDS AIRCRAFT FACTORIES FOKKER, RIJSWIJK.

Fatigue test results of carbon fiber reinforced plastic F28 aircraft component and its structural details
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ROYAL NETHERLANDS AIRCRAFT FACTORIES FOKKER, SCHIPHOL-OOST.

Design study for the inner wing of a transonic wing-body combination of aspect ratio 9
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Operational experience with adhesive bonded structures
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ROYAL SIGNALS AND RADAR ESTABLISHMENT, MALVERN (ENGLAND).
A comparison between electric field strengths similarly generated and measured in the open air, in a shielded enclosure and in a large aircraft hangar, over frequency range 10 to 110 MHz
[RSRE-MEMO-3290] p0086 N81-12353
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RUTGERS - THE STATE UNIV., PISCATAWAY, N. J.
Drag reduction - Jet breakup correlation with kerosene-based additives
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S

SAAB-SCANIA, GOTHENBURG (SWEDEN).
Buckling of sandwich panels subjected to axial compression, shear forces and lateral pressure. Part 2: Analysis
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SAAB-SCANIA, LINKOPING (SWEDEN).
Computer based in-flight monitoring
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Failure management for the SAAB Viggen JA37 aircraft
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SACRAMENTO AIR MATERIEL AREA, MCCLELLAN AFB, CALIF.
The use of acoustic emission for detection of active corrosion and degraded adhesive bonding in aircraft structure
[AD-A102923] p0631 N81-32522
SALFORD UNIV. (ENGLAND).
Jet wing interference for an overwing engine configuration
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SAN ANTONIO AIR LOGISTICS CENTER, KELLY AFB., TEX.
Contaminant increase in aircraft liquid oxygen converters: Analysis of data
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A-10/TF34 Turbine Engine Monitoring System (TEMS)
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SAN JOSE STATE COLL., CALIF.
Dynamic, hot surface ignition of aircraft fuels and hydraulic fluids
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SAN JOSE STATE UNIV., CALIF.
Perception of horizontal aircraft separation on a cockpit display of traffic information
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SANDERS AND THOMAS, INC., POTTSTOWN, PA.
Application of an in-line contamination monitoring unit to the AGE-60 Hydraulic Test Stand
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SANDIA LABS., ALBUQUERQUE, N. MEX.
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Recent darrieus Vertical-Axis Wind Turbine aerodynamical experiments at Sandia National Laboratories
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SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEX.
Organic compounds in the exhaust of a J85-5 turbine engine
[AD-A091712] p0130 N81-13866
SCIENCE APPLICATIONS, INC., CANOGA PARK, CALIF.
Mixing and combustion in high speed air flows
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Multiple-scale turbulence modeling of boundary layer flows for scramjet applications
[NASA-CR-3433] p0391 N81-23411
Combustion in high speed air flows
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SCIENTIFIC RESEARCH ASSOCIATES, INC., GLASTONBURY, CONN.
Analysis of turbulent flow about an isolated airfoil using a time dependent Navier-Stokes procedure
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SHAKER RESEARCH CORP., BALLSTON LAKE, N. Y.
Compressor blade monitoring system for a [illegible] (Allis Chalmers) Wind Tunnel Compressor
[AD-A092950] p0217 N81-17500
Rotor-bearing dynamics technology design guide. Part 6: Status of gas bearing technology applicable to aero propulsion machinery
[AD-A094167] p0257 N81-18079
SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE), WASHINGTON, D. C.
The Shock and Vibration Digest, volume 12, number 11
[AD-A092300] p0187 N81-15903
SIKORSKY AIRCRAFT, STRATFORD, CONN.
An active control system for helicopter vibration reduction by higher harmonic pitch
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An ABC status report
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Main rotor six degree-of-freedom isolation system analysis
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Advancing blade concept helicopter mission capabilities
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SIMMONDS PRECISION PRODUCTS, INC., VERGENNES, VERMONT.
Effects on anti-static additives on aircraft capacitance fuel gaging systems
[AD-A092987] p0211 N81-17035
SIMULA, INC., TEMPE, ARIZ.
Aircraft crash survival design guide. Volume 1: Design criteria and checklists, revision
[AD-A093784] p0206 N81-16997
SMITHS INDUSTRIES LTD., BASINGSTOKE (ENGLAND).
Microprocessor system test and monitoring
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Fault trees and system reliability analysis with reference to the control of aircraft engines
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Development tests of an engine with limited life
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SOCIETE NATIONALE D'ETUDE ET DE CONSTRUCTION DE MOTEURS D'AVIATION, MOISSY-CRAMAYEL (FRANCE).
Studying the exhaust gas from a post combustion turbojet engine
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Design development, and certification of a CFM56 engine: Resistance to the ingestion of foreign bodies
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SOCIETE NATIONALE D'ETUDE ET DE CONSTRUCTION DE MOTEURS D'AVIATION, SURESNES (FRANCE).
Material and structural problems in aircraft engine technology
[AAAF-NT-79-23] p0216 N81-17096
SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, CANNES (FRANCE).
Evolution of materials and associated technologies in the makeup of aerospace materials, part 1
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Evolution of materials and associated technologies in the makeup of aerospace materials. Part 2: Examples
[AAAF-NT-79-22-PT-2] p0209 N81-17031
SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, LES MUREAUX (FRANCE).
Applications of pyrotechniques in aviation
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SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, MARIGNANE (FRANCE.)
Erosion and impacts on composite helicopter blades
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Impact of modern materials on the development of rotating airfoil equipment
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The consequences of certain operational requirements on the conceptual design of combat helicopters
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SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, PARIS (FRANCE).
Organizing a design-to-cost program
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The effect of the in-service environment on composite materials (resume of the April 1980 Athens conference)
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Quality in design
[SNIAS-802-111-108] p0427 N81-24054
The AIRBUS hydraulic systems
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[SNIAS-802-111-112] p0427 N81-24056
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System digitization: Its effect in the cockpit
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SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, SURESNES (FRANCE).
Elastomers used in aeronautics industry
[SNIAS-801-551-105] p0031 N81-10168
Tests on the fire resistance behavior of materials inside civil aircraft
[SNIAS-801-551-101] p0074 N81-12052
The resistance of tank protective measures to microorganisms
[SNIAS-801-551-107] p0144 N81-15072
SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, TOULOUSE (FRANCE).
Synthesis of test results obtained with Concorde at high incidences
[AAAF-NT-80-26] p0077 N81-12079
The future cockpit of the next generation of civil aircraft
[SNIAS-802-111-113] p0427 N81-24057
performance control and qualification tests of civil aviation turbine engines in tests conducted by airframe manufacturers
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SOLAR TURBINES INTERNATIONAL, SAN DIEGO, CALIF.
Development of a low NO/x/ lean premixed annular combustor
[ASME PAPER 81-GT-40] p0312 A81-29954
Internal coating of air-cooled gas turbine blades
[NASA-CR-165337] p0429 N81-24068
SONOBOND CORP., WESTCHESTER, PA.
Ultrasonic cold forming of aircraft sheet materials
[AD-A096351] p0344 N81-21239
SOUTHAMPTON UNIV. (ENGLAND).
The principles and applications of cryogenic wind tunnels
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Static charge in aircraft fuel tanks
[AD-A093552] p0208 N81-17045
Model and boundary aerodynamic data from high blockage two-dimensional airfoil tests in a shallow unstreamlined transonic flexible walled test section
[NASA-CR-165685] p0343 N81-21087
An active noise reduction system for aircrew helmets
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SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS, LOS ANGELES
Southern California aviation system study
[PB80-215544] p0125 N81-13916
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
Analytical procedures for characterizing unregulated emissions from vehicles using middle-distillate fuels
[PB81-136186] p0344 N81-21
Engine isolation for structural-borne interior noise reduction in a general aviation aircraft
[NASA-CR-3427] p0446 N81-257
Behavior of fuels at low temperatures
[AD-A100332] p0542 N81-282
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[AD-A100489] p0542 N81-282
SPECTRON DEVELOPMENT LABS., INC., COSTA MESA, CALIF.
Fuel injector characterization studies
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A study in flow control and screening methods for aircraft laser turrets
[AD-A101723] p0548 N81-291
SPERRY FLIGHT SYSTEMS, PHOENIX, ARIZ.
V/STOL AND digital avionics system for UH-1H
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V/STOLAND digital avionics system for XV-15 tilt rotor
[NASA-CR-152320] p0375 N81-2
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Airport and airspace delay model description
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Analysis of middle distillate fuels by field ionization mass spectrometry
[AD-A099407] p0491 N81-26
Engineering effects of advanced composite materials on avionics
[AD-A104015] p0640 N81-32
STANFORD UNIV., CALIF.
Disturbance estimation for a STOL transport during landing
[AIAA PAPER 81-0018] p0150 A81-2054
A numerical simulation of hypersonic viscous flow over arbitrary geometries at angle of attack
[AIAA PAPER 81-0050] p0158 A81-20
Prediction and experimental verification of transient airfoil motion in a small wind tunnel
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Partially confined multiple jet mixing
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The controlled growth method - A tool for structural optimization
[AIAA 81-0549] p0301 A81-29
Dynamic analysis of a free-tip rotor
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A hybrid state vector approach to aeroelastic analysis with application to composite lifting surfaces
[AIAA 81-0626] p0308 A81-29
Dynamic stability of a rotor blade using finite element analysis
[AIAA 81-0615] p0309 A81-29
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Fog dispersion
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TENNESSEE UNIV. SPACE INST., TULLAHOMA.
Proceedings: Fourth Annual Workshop on Meteorological and Environmental Inputs to Aviation Systems
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Large area gas discharge displays
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Flight experiments with a slender cone at angle of attack
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Sensor/actuator failure detection for turbofan engines
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TORONTO UNIV., DOWNSVIEW (ONTARIO).
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TORONTO UNIV. (ONTARIO).
The turbulent wind and its effect on flight
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TRW SYSTEMS AND ENERGY, REDONDO BEACH, CALIF.
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TUEBINGEN UNIV. (WEST GERMANY).
Horizontal components of the atmospheric electric field. Studies of the atmospheric electric field in view of electrostatically controlled automatic pilot applications
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Evaluation of the potential format and content of a cockpit display of traffic information
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Design, fabrication and test of a complex helicopter airframe section
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CH-53E emergency flotation system design (???)
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Flight test of a full authority Digital Electronic Engine Control system in an F-15 aircraft
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UNITED TECHNOLOGIES CORP., WINDSOR LOCKS, CONN.
Requirements, technology and configuration evaluation for Crash Survivable Flight Data Recording (CSFDR) system
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UNITED TECHNOLOGIES RESEARCH CENTER, EAST HARTFORD, CONN.
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UNIVERSITE DES SCIENCES ET TECHNIQUES DE LILLE (FRANCE).
Influence of light aircraft architecture on its spin characteristics
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UNIVERSITY OF SOUTH FLORIDA, TAMPA.
Investigation of low level aircraft nonavionic nonlinear interference
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Transonic swept wings studied by the lifting-line theory
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Civil component program Wing Section. New calculation methods for subsonic and transonic interference with planar and spatial flows
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Curved-flow, rolling-flow, and oscillatory
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Minimum noise impact aircraft trajectories
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VON KARMAN INST. FOR FLUID DYNAMICS,
RHODE-SAINT-GENESE (BELGIUM).
Analytical characteristics methods: Applications
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Inlet flow in centrifugal pumps at partial
deliveries
[VKI-PREPRINT-1979-16] p0031 N81-10437
Reverse flow, pre-rotation and unsteady inlet
flow in centrifugal pumps
[VKI-PREPRINT-1979-15] p0085 N81-12433
Computational Fluid Dynamics, volume 2
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Physical and numerical aspects of shock boundary
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VOUGHT CORP., DALLAS, TEX.
Additional testing of the inlets designed for a
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Power system control study. Phase 1:
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VOUGHT CORP. ADVANCED TECHNOLOGY CENTER, INC.,
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Turbulence modeling for application to V/STOL
propulsion induced effects: Two dimensional
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VULCAN INDUSTRIAL PACKAGING LTD., REXDALE (ONTARIO).
Evaluation of explosafe. Explosion suppression
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Disturbance estimation for a STOL transport
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Recent improvements on generating voltmeters
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WASHINGTON UNIV., ST. LOUIS, MO.
Adaptive finite element technology in integrated
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WEAPONS SYSTEMS RESEARCH LAB., ADELAIDE (AUSTRALIA).
Low-speed wind-tunnel tests of two
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WEATHER WING (5TH), LANGLEY AFB, VA.
Terminal Forecast Reference Notebook (TFRN) for
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WESTINGHOUSE ELECTRIC CORP., CONCORDVILLE, PA.
Compressor configuration and design optimization
for the high reliability gas turbine
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WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
Low NO/x/ and fuel flexible gas turbine combustors
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WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
Low NO/x/ and fuel flexible gas turbine combustors
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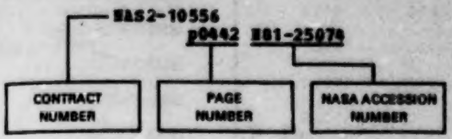

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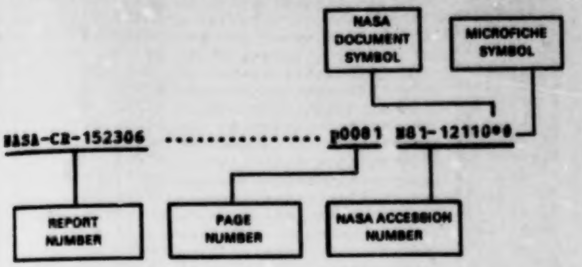

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AD-A103894	p0636	N81-33183	#
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AD-A104015	p0640	N81-33280	#
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AD-A104154	p0639	N81-33216	#
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AD-A104161	p0636	N81-33177	#
AD-E200630	p0219	N81-17333	#
AD-E430597	p0439	N81-25065	#
AD-E800237	p0373	N81-22035	#
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AEDC-TR-79-59	p0217	N81-17106	#
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AEDC-TR-79-77	p0036	N81-11040	#
AEDC-TR-79-87	p0094	N81-13068	#
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AEDC-TR-80-8	p0126	N81-13931	#
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AEDC-TR-80-11	p0038	N81-11093	#
AEDC-TR-80-20	p0133	N81-14275	#
AEDC-TR-80-32	p0630	N81-32155	#
AEDC-TR-80-34	p0131	N81-13577	#
AEDC-TR-80-35	p0439	N81-25084	#
AEDC-TR-80-60	p0628	N81-32140	#
AEDC-TR-81-3	p0627	N81-32124	#
AEDC-TSR-80-V16	p0217	N81-17105	#
AEDC-TSR-81-V18	p0635	N81-33163	#
AEH-200	p0034	N81-11026	#
AERO-454.017/80	p0434	N81-24110	#
AEROCHEM-TP-407	p0540	N81-28099	#
AESO-161-01-80	p0088	N81-12653	#
AFAL-TR-79-1235	p0028	N81-10063	#
AFAMRL-TR-80-98	p0539	N81-28086	#
AFAMRL-TR-80-104	p0259	N81-18853	#
AFAMRL-TR-80-105	p0041	N81-11233	#
AFAMRL-TR-80-116	p0210	N81-17058	#
AFAMRL-TR-80-128	p0446	N81-25578	#
AFAMRL-TR-80-130	p0249	N81-18034	#
AFAMRL-TR-81-21	p0341	N81-21070	#
AFAMRL-TR-81-25	p0426	N81-24049	#
AFAMRL-TR-81-28	p0500	N81-27889	#
AFAPL-TR-76-43-VOL-6	p0026	N81-10055	#
AFAPL-TR-78-6-PT-6	p0257	N81-18394	#
AFAPL-TR-79-2072	p0029	N81-10073	#
AFAPL-TR-79-2095	p0254	N81-18139*	#
AFESC/ESL-TR-79-29	p0029	N81-10073	#
AFESC/ESL-TR-79-30	p0087	N81-12651	#
AFESC/ESL-TR-79-43	p0030	N81-10080	#
AFESC/ESL-TR-80-1	p0023	N81-10024	#
AFESC/ESL-TR-80-04	p0088	N81-12653	#
AFESC/ESL-TR-80-17-VOL-1	p0032	N81-10580	#
AFESC/ESL-TR-80-17-VOL-2	p0032	N81-10581	#
AFESC/ESL-TR-80-25	p0542	N81-28277	#
AFESC/ESL-TR-80-32	p0194	N81-16043	#
AFESC/ESL-TR-80-38	p0087	N81-12652	#
AFESC/ESL-TR-80-46	p0278	N81-19323	#
AFESC/ESL-TR-81-03	p0540	N81-28098	#
AFFDL-TR-76-140	p0492	N81-26847	#
AFFDL-TR-77-120	p0492	N81-26849*	#
AFFDL-TR-78-194-PT-4	p0139	N81-14969	#
AFFDL-TR-79-3103	p0091	N81-13019	#
AFFTC-TIH-77-1-VOL-1	p0076	N81-12073	#
AFFTC-TIH-77-1-VOL-2	p0076	N81-12073	#
AFFTC-TIH-79-2	p0076	N81-12073	#
AFFTC-TIH-81-1	p0548	N81-29123	#
AFGL-TR-80-0226	p0331	N81-20045	#
AFGL-TR-80-0367	p0372	N81-22023	#
AFHRL-TP-81-17	p0590	N81-31184	#
AFHRL-TR-79-4	p0211	N81-17062	#
AFHRL-TR-79-27	p0277	N81-19143	#
AFHRL-TR-79-51	p0343	N81-21089	#
AFHRL-TR-80-20	p0254	N81-18066	#
AFHRL-TR-80-60	p0602	N81-31235	#
AFHRL-TR-81-3	p0601	N81-31234	#
AFHRL-TR-81-4-1-VOL-1	p0389	N81-23083	#
AFHRL-TR-81-4-1-VOL-1	p0390	N81-23084	#
AFISC-TR-81-001	p0635	N81-33173	#
AFIT-CI-80-10T	p0197	N81-16067	#
AFIT-CI-80-22D	p0185	N81-15975	#
AFIT-CI-80-36D	p0191	N81-16023	#
AFIT-CI-80-67T	p0587	N81-30476	#
AFIT-CI-80-68T	p0585	N81-30160	#
AFIT-LSSR-10-81	p0631	N81-33134	#
AFIT-LSSR-26-81	p0632	N81-33135	#
AFIT-LSSR-36-80	p0031	N81-10446	#
AFIT-LSSR-68-80	p0028	N81-10070	#
AFIT/DS/EE/81-1	p0551	N81-29317	#
AFIT/GAE/AA/80D-2	p0263	N81-19031	#
AFIT/GAE/AA/80D-5	p0263	N81-19033	#
AFIT/GAE/AA/80D-10	p0277	N81-19143	#
AFIT/GAE/AA/80D-12	p0540	N81-28105	#
AFIT/GAE/AA/80D-14	p0263	N81-19032	#
AFIT/GAE/AA/80D-17	p0273	N81-19107	#
AFIT/GAE/AA/80D-21	p0273	N81-19108	#
AFIT/GCS/EE/80-1	p0552	N81-29354	#
AFIT/GE/EE/80D-36	p0549	N81-29136	#
AFIT/GOR/OS/80D-1	p0261	N81-19015	#
AFIT/GST/OS/81M-1	p0539	N81-28091	#
AFIT/GST/OS/81M-3	p0539	N81-28090	#
AFIT/GST/OS/81M-9	p0547	N81-29120	#
AFLRL-136	p0542	N81-28276	#
AFML-TR-78-195	p0048	N81-12010	#
AFML-TR-79-4173-PT-1	p0036	N81-11041	#
AFML-TR-79-4173-PT-2	p0029	N81-10074	#
AFML-TR-79-4222	p0048	N81-12010	#
AFOSR-80-0476TR	p0030	N81-10120	#
AFOSR-80-0754TR	p0045	N81-11774	#
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AFOSR-80-1357TR	p0203	N81-16984	#
AFOSR-80-1359TR	p0217	N81-17104	#
AFOSR-81-0109TR	p0335	N81-20079*	#
AFOSR-81-0286TR	p0423	N81-24028	#
AFOSR-81-0309TR	p0375	N81-22049	#
AFOSR-81-0313TR	p0384	N81-23025	#
AFOSR-81-0479TR	p0541	N81-28108	#
AFOSR-81-0480TR	p0541	N81-28109	#
AFOSR-81-0572TR	p0593	N81-31353	#

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AFOSR-81-0594TR p0602 N81-31320 #
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AFWAL-TR-80-2 p0209 N81-17047 #
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AFWAL-TR-80-2023 p0133 N81-14276 #
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AFWAL-TR-80-2032 p0215 N81-17093 #
AFWAL-TR-80-2035 p0029 N81-10072 #
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AFWAL-TR-80-3023 p0377 N81-22106 #
AFWAL-TR-80-3029 p0257 N81-18374 #
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AFWAL-TR-80-3032-VOL-3 p0495 N81-27082 #
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AFWAL-TR-80-3084 p0127 N81-13940 #
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AFWAL-TR-80-3092 p0204 N81-16995 #
AFWAL-TR-80-3094 p0374 N81-22042 #
AFWAL-TR-80-3105 p0330 N81-20034 #
AFWAL-TR-80-3110-PT-1 p0637 N81-33192 #
AFWAL-TR-80-3115 p0483 N81-26082 #
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AFWAL-TR-80-3132-PT-2 p0638 N81-33197 #
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AFWAL-TR-80-3141-PT-2 p0581 N81-30114 #
AFWAL-TR-80-3141-PT-3 p0581 N81-30115 #
AFWAL-TR-80-4075 p0131 N81-14061 #
AFWAL-TR-80-4081-PT-1 p0257 N81-18419 #
AFWAL-TR-80-4081-PT-2 p0258 N81-18420 #
AFWAL-TR-80-4098 p0218 N81-17235 #
AFWAL-TR-80-4102-PT-1 p0539 N81-28089 #
AFWAL-TR-80-4118 p0335 N81-20080 #
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AFWAL-TR-81-2016 p0552 N81-29536 #
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AFWAL-TR-81-3004 p0540 N81-28104 #
AFWAL-TR-81-3027 p0498 N81-27117 #
AFWAL-TR-81-3032 p0492 N81-27051 #
AFWAL-TR-81-3070 p0564 N81-30138*#

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AGARD-AG-255 p0211 N81-17063 #

AGARD-AR-146 p0392 N81-23431 #
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AGARD-CP-288 p0039 N81-11128 #
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AGARD-CP-311 p0603 N81-31[illegible] #
AGARD-CP-313 p0632 N81-3[illegible] #

AGARD-LS-107 p0583 N81-301[illegible] #
AGARD-LS-113 p0497 N81-27103 #
AGARD-LS-114 p0590 N81-31[illegible] #

AGARD-MAN-10(ENG) p0640 N81-3[illegible] #

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AGARD-R-691 p0333 N81-20064 #
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AGARDOGRAPH-255 p0211 N81-17063 #

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AHS 80-4 p0473 A81-40139
AHS 80-8 p0473 A81-40141
AHS 80-10 p0473 A81-40143
AHS 80-11 p0474 A81-40144
AHS 80-12 p0474 A81-40145
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AHS 80-22 p0475 A81-40152
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AIAA PAPER 81-1594	p0508	A81-40969*#
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AIAA PAPER 81-1670	p0526	A81-43152 #
AIAA PAPER 81-1671	p0534	A81-43945 #
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AIAA PAPER 81-1715	p0527	A81-43165 #
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AIAA PAPER 81-1971	p0618	A81-48612*#
AIAA PAPER 81-1981	p0624	A81-49736*#
AIAA PAPER 81-1982	p0618	A81-48602 #
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AIAA PAPER 81-2003	p0619	A81-48615*#
AIAA PAPER 81-2004	p0620	A81-48634 #
AIAA PAPER 81-2005	p0624	A81-49732 #
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AIAA PAPER 81-2018	p0624	A81-49731*#
AIAA PAPER 81-2020	p0623	A81-49730 #
AIAA PAPER 81-2022	p0618	A81-48606 #
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AIAA-PAPER-81-0151 .... p0581 N81-30116 #
AIAA-PAPER-81-0639 .... p0499 N81-27548*#
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AIAA-81-0051 .... p0203 N81-16983 #
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AIME PAPER F79-10 .... p0059 A81-14770 #

AIRESEARCH-21-2861 .... p0274 N81-19119*#
AIRESEARCH-21-2953-2-VOL-2 .... p0078 N81-12008*#
AIRESEARCH-21-2997 .... p0274 N81-19117*#
AIRESEARCH-21-3213-2 .... p0497 N81-27090*#
AIRESEARCH-21-3663-PT-2 .... p0048 N81-11953*#

AMA-80-1 .... p0600 N81-31224*#

AMMRC-TR-80-25 .... p0134 N81-14324 #
AMMRC-TR-80-44 .... p0038 N81-11116 #
AMMRC-TR-80-57 .... p0337 N81-20447 #
AMMRC-TR-81-1 .... p0344 N81-21239 #
AMMRC-TR-81-32 .... p0640 N81-33281 #

APR-79-021 .... p0134 N81-14324 #

AR-2 .... p0270 N81-19464 #
AR-3 .... p0585 N81-30108 #
AR-6 .... p0343 N81-21131*#
AR-76-3 .... p0262 N81-19023*#
AR-001-724 .... p0021 N81-10007 #
AR-001-777 .... p0341 N81-21065 #
AR-001-798 .... p0377 N81-22063 #
AR-001-806 .... p0043 N81-11365 #
AR-001-808 .... p0263 N81-19028 #
AR-001-811 .... p0389 N81-23077 #
AR-002-036 .... p0136 N81-14575 #
AR-002-236 .... p0499 N81-27206 #

ARA-MEMO-220 .... p0090 N81-13024 #

ARBRL-MR-03079 .... p0439 N81-25045 #

ARC-R/M-3841 .... p0144 N81-15009 #
ARC-R/M-3842-PT-2 .... p0021 N81-10010 #
ARC-R/M-3843 .... p0031 N81-10436 #
ARC-R/M-3848 .... p0082 N81-12113 #

ARC-37815 .... p0021 N81-10010 #
ARC-37974 .... p0144 N81-15009 #
ARC-38052 .... p0031 N81-10436 #
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ARC-38234 .... p0082 N81-12113 #

ARD-443 .... p0339 N81-21050 #
ARD-500 .... p0435 N81-24118 #

ARDU-TI-466 .... p0638 N81-33204 #
ARDU-TI-698 .... p0076 N81-12068 #

ARI-TR-441 .... p0035 N81-11035 #

ARL-TR-81-21 .... p0602 N81-31421*#

ARL/AERO-NOTE-390 .... p0021 N81-10007 #
ARL/AERO-NOTE-400 .... p0424 N81-24031 #
ARL/AERO-TM-318 .... p0201 N81-16430 #
ARL/AERO-TM-319 .... p0043 N81-11364 #
ARL/AERO-TM-322 .... p0043 N81-11365 #
ARL/AERO-TM-325 .... p0374 N81-22043 #
ARL/MECH-ENG-NOTE-377 .... p0341 N81-21065 #
ARL/MECH-ENG-NOTE-378 .... p0389 N81-23077 #
ARL/PSU/TM-80-45 .... p0090 N81-13033 #
ARL/PSU/TM-80-188 .... p0274 N81-19128 #
ARL/STRUC-NOTE-459 .... p0263 N81-19028 #
ARL/STRUC-NOTE-461 .... p0384 N81-23024 #
ARL/STRUC-NOTE-465 .... p0499 N81-27206 #
ARL/STRUC-TM-327 .... p0426 N81-24051 #
ARL/STRUC-381 .... p0391 N81-23289 #
ARL/SYS-71 .... p0377 N81-22063 #

ARO-14100.1-E .... p0196 N81-16062 #
ARO-14795.1-E .... p0394 N81-23864 #
ARO-15666.4-A-E .... p0580 N81-30091 #

ASC-R-126 .... p0071 N81-12013 #

ASD-TR-80-5010 .... p0423 N81-24020 #
ASD-TR-80-5011 .... p0423 N81-24020 #
ASD-TR-80-5024 .... p0543 N81-28784 #
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ASD-TR-80-5028 .... p0543 N81-28787 #
ASD-TR-80-5035 .... p0426 N81-24050 #
ASD-TR-80-5037 .... p0628 N81-32142 #
ASD-TR-80-5038 .... p0208 N81-17044 #
ASD-TR-80-5050-VOL-1 .... p0539 N81-28092 #

ASD-TR-80-5050-VOL-2 .... p0539 N81-28093 #
ASD-TR-81-5008 .... p0423 N81-24020 #
ASD-TR-81-5009 .... p0427 N81-24059 #
ASD-TR-81-5010 .... p0442 N81-25072 #
ASD-TR-5011 .... p0583 N81-30127 #

ASD-81-6-1 .... p0466 N81-26116*#

ASF-300 .... p0033 N81-11022 #

ASLE PREPRINT 80-LC-6B-3 .... p0118 A81-18758
ASLE PREPRINT 80-LC-8A-6 .... p0118 A81-18748
ASLE PREPRINT 81-AM-6A-3 .... p0367 A81-33868

ASME PAPER 80-C2/AERO-10 .... p0116 A81-18639 #
ASME PAPER 80-C2/DET-12 .... p0116 A81-18640 #
ASME PAPER 80-C2/DET-17 .... p0116 A81-18642 #
ASME PAPER 80-C2/DET-71 .... p0117 A81-18646 #
ASME PAPER 80-C2/DET-77 .... p0117 A81-18648 #
ASME PAPER 80-C2/DET-103 .... p0117 A81-18654 #
ASME PAPER 80-C2/LUB-14 .... p0117 A81-18668*#
ASME PAPER 80-C2/LUB-17 .... p0117 A81-18671 #
ASME PAPER 80-C2/LUB-18 .... p0117 A81-18672*#
ASME PAPER 80-C2/LUB-35 .... p0117 A81-18683*#
ASME PAPER 80-GT-16 .... p0019 A81-12609 #
ASME PAPER 80-GT-20 .... p0109 A81-17952*#
ASME PAPER 80-GT-81 .... p0109 A81-17953*#
ASME PAPER 80-GT-95 .... p0109 A81-17954*#
ASME PAPER 80-WA/DSC-12 .... p0170 A81-21083 #
ASME PAPER 80-WA/HC-2 .... p0170 A81-21120*#
ASME PAPER 81-GB-216 .... p0318 A81-30104 #
ASME PAPER 81-GT-1 .... p0310 A81-29926 #
ASME PAPER 81-GT-2 .... p0310 A81-29927 #
ASME PAPER 81-GT-3 .... p0310 A81-29928 #
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ASME PAPER 81-GT-68 .... p0313 A81-29977 #
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ASME PAPER 81-GT-78 .... p0314 A81-29986 #
ASME PAPER 81-GT-79 .... p0314 A81-29987*#
ASME PAPER 81-GT-87 .... p0314 A81-29994 #
ASME PAPER 81-GT-88 .... p0314 A81-29995 #
ASME PAPER 81-GT-90 .... p0314 A81-29997 #
ASME PAPER 81-GT-95 .... p0314 A81-30002 #
ASME PAPER 81-GT-96 .... p0314 A81-30003*#
ASME PAPER 81-GT-99 .... p0315 A81-30006*#
ASME PAPER 81-GT-100 .... p0315 A81-30007 #
ASME PAPER 81-GT-103 .... p0315 A81-30009 #
ASME PAPER 81-GT-105 .... p0315 A81-30010 #
ASME PAPER 81-GT-107 .... p0315 A81-30012 #
ASME PAPER 81-GT-111 .... p0315 A81-30016 #
ASME PAPER 81-GT-113 .... p0315 A81-30017 #
ASME PAPER 81-GT-114 .... p0315 A81-30018 #
ASME PAPER 81-GT-118 .... p0316 A81-30022 #
ASME PAPER 81-GT-128 .... p0316 A81-30032 #
ASME PAPER 81-GT-129 .... p0316 A81-30033*#
ASME PAPER 81-GT-130 .... p0316 A81-30034 #
ASME PAPER 81-GT-132 .... p0316 A81-30035 #
ASME PAPER 81-GT-137 .... p0316 A81-30039 #
ASME PAPER 81-GT-138 .... p0316 A81-30040 #
ASME PAPER 81-GT-138 .... p0316 A81-30041 #
ASME PAPER 81-GT-154 .... p0317 A81-30053 #
ASME PAPER 81-GT-161 .... p0317 A81-30060*#
ASME PAPER 81-GT-165 .... p0317 A81-30064 #
ASME PAPER 81-GT-184 .... p0317 A81-30078*#
ASME PAPER 81-GT-189 .... p0317 A81-30082 #
ASME PAPER 81-GT-191 .... p0317 A81-30084 #
ASME PAPER 81-GT-194 .... p0317 A81-30086 #
ASME PAPER 81-GT-199 .... p0317 A81-30090 #
ASME PAPER 81-GT-202 .... p0318 A81-30092 #
ASME PAPER 81-GT-203 .... p0318 A81-30093*#
ASME PAPER 81-GT-206 .... p0318 A81-30096 #
ASME PAPER 81-GT-208 .... p0318 A81-30097*#
ASME PAPER 81-GT-209 .... p0318 A81-30098 #
ASME PAPER 81-GT-213 .... p0318 A81-30102 #

ASRL-TR-196-2 .... p0549 N81-29134*#
ASRL-TR-196-3 .... p0549 N81-29135*#

ATC-R-91000/9CR-66 .... p0072 N81-12026 #
ATC-R-91100/9CR-71 .... p0072 N81-12028 #

ATC-93 .... p0387 N81-23063 #
ATC-96 .... p0034 N81-11028 #
ATC-101 .... p0331 N81-20055 #
ATC-102 .... p0250 N81-18040 #
ATC-103 .... p0270 N81-19084 #
ATC-104 .... p0547 N81-29112 #
ATC-106 .... p0547 N81-29113 #

ATR-2 .... p0446 N81-25437 #

AV-R-80/540 .... p0101 A81-16721 #

AVRADCOM-TR-81-B-1 .... p0106 N81-15982*#

AVRADCOM-TR-79-49 .... p0125 N81-13918*#
AVRADCOM-TR-80-A-15 .... p0026 N81-10054*#
AVRADCOM-TR-80-C-13 .... p0036 N81-11038*#
AVRADCOM-TR-80-C-17 .... p0334 N81-20076*#
AVRADCOM-TR-80-C-19 .... p0336 N81-20205*#
AVRADCOM-TR-80-D-27 .... p0486 N81-26121 #
AVRADCOM-TR-80-E-4 .... p0446 N81-25691 #
AVRADCOM-TR-81-B-4 .... p0546 N81-29109*#
AVRADCOM-TR-81-C-10 .... p0443 N81-25081*#
AVRADCOM-TR-81-C-12 .... p0376 N81-22055*#
AVRADCOM-TR-81-C-24 .... p0496 N81-27095*#

AVSD-0154-80-RR .... p0085 N81-12827 #

BBN-3869 .... p0221 N81-17049 #
BBN-4220 .... p0589 N81-30910 #
BBN-4420 .... p0258 N81-18799*#
BBN-4435 .... p0438 N81-24862 #
BBN-10667-10676 .... p0202 N81-16629 #

BDM/W-79-733-TR .... p0580 N81-30102 #

BFG-80-31-023 .... p0255 N81-18201 #

BM-RI-8477 .... p0392 N81-23269 #

BMFT-FB-T-78-02 .... p0376 N81-22058*#
BMFT-FB-T-79-137 .... p0275 N81-19128 #
BMFT-FB-T-79-152 .... p0275 N81-19129 #
BMFT-FB-T-80-025 .... p0497 N81-27102 #

BMFT-FB-W-79-42 .... p0425 N81-24085 #
BMFT-FB-W-80-008 .... p0425 N81-24086 #
BMFT-FB-W-80-021 .... p0426 N81-24052 #
BMFT-FB-W-80-022 .... p0424 N81-24038 #
BMFT-FB-W-80-023 .... p0426 N81-24053 #
BMFT-FB-W-80-030 .... p0541 N81-28111 #
BMFT-FB-W-80-032 .... p0499 N81-27208 #

BMFT-01ZA005/NTS1003 .... p0497 N81-27103 #

BMVG-FBWT-79-28 .... p0209 N81-17089 #
BMVG-FBWT-80-4 .... p0342 N81-21076 #
BMVG-FBWT-80-7 .... p0345 N81-21677 #

BNL-51390 .... p0630 N81-32373 #

BR72779 .... p0022 N81-10015 #
BR73151 .... p0031 N81-10436 #
BR73152 .... p0021 N81-10010 #
BR73155 .... p0026 N81-10084 #
BR73233 .... p0144 N81-15009 #
BR73471 .... p0084 N81-12353 #
BR73977 .... p0084 N81-12320 #
BR74711 .... p0330 N81-20046 #
BR74909 .... p0073 N81-12830 #
BR76387 .... p0605 N81-31586 #
BR78592 .... p0601 N81-31225 #
BR79052 .... p0026 N81-10085 #

BR79052	p0026	N81-10046 #
BR79125	p0022	N81-10016 #
BU-242	p0434	N81-24109 #
BU-248	p0338	N81-21039 #
BU-251	p0375	N81-22046 #
BU-257	p0330	N81-20043 #
BU-258	p0336	N81-20193 #
CALSPAN-RK-6040-[illegible]-2	p0343	N81-21088 #
CALSPAN-6286-F-1	p0638	N81-33199 #
CALSPAN-6339-F-3	p0130	N81-13569*#
CALSPAN-6374-[illegible]-1	p0131	N81-13977 #
CALSPAN-6406-A-1	p0196	N81-16063 #
CASS-MV-80-2	p0339	N81-21049 #
CEL-TN-156-ADD	p0219	N81-17299 #
CEL-TN-158	p0030	N81-10079 #
CERL-TR-[illegible]-100	p0588	N81-30659 #
CETIM-[illegible]-F-091	p0256	N81-18322 #
CHEP-6-4120-VOL-39	p0600	N81-31220 #
CE-DSN-0082-5247	p0033	N81-11020 #
CONF-801114-1	p0135	N81-14550 #
CONF-801211-1	p0193	N81-16037 #
CONF-810104-1	p0256	N81-18259 #
CONF-810226-5	p0588	N81-30615 #
CONF-810816-1	p0638	N81-33200 #
COO-4867-07	p0134	N81-14329 #
CPIA-PUBL-329-VOL-1	p0200	N81-16253*
CRI-7846-14	p0023	N81-10020*#
CRINC/FRL-281-3	p0262	N81-19021*#
CRREL-SR-81-10	p0639	N81-33214 #
CSC/TR-80/6008	p0146	N81-15729 #
CSIR-ME-1674	p0550	N81-29167 #
CUED/A-AERO/TR-9	p0090	N81-13026 #
CUED/A-TURBO/TR-98	p0090	N81-13021 #
CUED/A-TURBO/TR-101	p0093	N81-13059 #
C80-904/201	p0552	N81-29536 #
D-210-11788-1	p0329	N81-20027*#
DARCOM-R-310-6	p0367	N81-23062 #
DARCOM-R-310-6	p0392	N81-23358 #
DCIEM-TC-80-C-66	p0375	N81-22050 #
DDA-EDR-9762	p0029	N81-10073 #
DDA-EDR-10339	p0081	N81-12108 #
DELET-TR-78-2990-3	p0440	N81-25058 #
DELET-TR-79-0290-1	p0437	N81-24360 #
DE81-029834	p0638	N81-33201 #
DFVLR-FB-78-09	p0022	N81-10017 #
DFVLR-FB-78-26	p0022	N81-10018 #
DFVLR-FB-79-12	p0197	N81-16069 #
DFVLR-FB-79-14	p0086	N81-12536 #
DFVLR-FB-79-18	p0276	N81-19135 #
DFVLR-FB-79-20	p0077	N81-12680 #
DFVLR-FB-79-29	p0500	N81-27093 #
DFVLR-FB-79-30	p0025	N81-10043 #
DFVLR-FB-79-38	p0373	N81-22038 #
DFVLR-FB-79-40	p0027	N81-10062 #
DFVLR-FB-80-01	p0132	N81-14195 #
DFVLR-FB-80-02	p0372	N81-22029 #
DFVLR-FB-80-06	p0127	N81-13942 #
DFVLR-FB-80-07	p0131	N81-13975 #
DFVLR-FB-80-13	p0128	N81-13944 #
DFVLR-FB-80-14	p0130	N81-13970 #
DFVLR-FB-80-16	p0138	N81-14796 #
DFVLR-FB-80-22	p0126	N81-13929 #
DFVLR-FB-81-15	p0601	N81-31226 #

DFVLR-FB-81-16	p0594	N81-31154 #
DFVLR-MITT-79-03	p0382	N81-23000 #
DFVLR-MITT-79-09	p0339	N81-21061 #
DFVLR-MITT-79-10	p0028	N81-10064 #
DFVLR-MITT-79-13	p0030	N81-10078 #
DFVLR-MITT-79-14	p0133	N81-14280 #
DFVLR-MITT-79-16	p0130	N81-13971 #
DFVLR-MITT-79-20	p0142	N81-14892 #
DFVLR-MITT-79-28	p0538	N81-28079 #
DFVLR-MITT-80-04	p0092	N81-13052 #
DFVLR-MITT-80-04	p0129	N81-13960 #
DFVLR-MITT-80-05	p0126	N81-13926 #
DFVLR-MITT-80-07	p0129	N81-13952 #
DFVLR-MITT-80-08	p0075	N81-12063 #
DFVLR-MITT-80-14	p0332	N81-20038 #
DFVLR-MITT-80-15	p0338	N81-21040 #
DFVLR-MITT-81-02	p0538	N81-28080 #
DGLR PAPER 79-063	p0016	A81-11780
DGLR PAPER 80-029	p0055	A81-13925 #
DGLR PAPER 80-103	p0120	A81-19392 #
DGLR PAPER 80-106	p0120	A81-19393 #
DGLR PAPER 80-109	p0120	A81-19395 #
DGLR PAPER 80-110	p0120	A81-19396 #
DGLR PAPER 80-111	p0120	A81-19397 #
DGLR PAPER 80-112	p0121	A81-19398 #
DGLR PAPER 80-116	p0121	A81-19399 #
DGLR PAPER 81-003	p0611	A81-47621 #
DGLR PAPER 81-014	p0608	A81-47557
DGLR PAPER 81-021	p0609	A81-47598 #
DGLR PAPER 81-025	p0608	A81-47554 #
DGLR PAPER 81-026	p0608	A81-47555 #
DGLR PAPER 81-027	p0609	A81-47563 #
DGLR PAPER 81-034	p0609	A81-47585 #
DGLR PAPER 81-035	p0608	A81-47556
DGLR PAPER 81-036	p0610	A81-47604 #
DGLR PAPER 81-046	p0610	A81-47601 #
DGLR PAPER 81-047	p0611	A81-47622 #
DGLR PAPER 81-052	p0609	A81-47564 #
DGLR PAPER 81-055	p0607	A81-47551 #
DGLR PAPER 81-056	p0610	A81-47603 #
DGLR PAPER 81-057	p0609	A81-47565 #
DGLR PAPER 81-060	p0610	A81-47612 #
DGLR PAPER 81-062	p0610	A81-47609 #
DGLR PAPER 81-063	p0609	A81-47580 #
DGLR PAPER 81-064	p0611	A81-47620 #
DGLR PAPER 81-065A	p0608	A81-47552
DGLR PAPER 81-065B	p0608	A81-47553
DGLR PAPER 81-066	p0610	A81-47616 #
DGLR PAPER 81-067	p0608	A81-47562 #
DGLR PAPER 81-118	p0609	A81-47587 #
DGLR-79-051	p0203	N81-16987 #
DGLR-79-094	p0220	N81-17483 #
DGLR-79-058	p0203	N81-16988 #
DGRST/CSTB-63-FR-130	p0146	N81-15579*#
DHC-DND-77-4	p0337	N81-21010*#
DHC-DND-80-1	p0483	N81-26076*#
DLGR-79-096	p0272	N81-19102 #
DNA-5260F	p0196	N81-16063 #
DNA-5341F	p0198	N81-16073 #
DOD-4650.4-P-VOL-1	p0206	N81-17030 #
DOD-4650.4-P-VOL-2	p0207	N81-17031 #
DOD-4650.4-P-VOL-3	p0207	N81-17032 #
DOD-4650.4-P-VOL-4	p0207	N81-17033 #
DOE/BETC/RPS-81/2	p0465	N81-25255 #
DOE/CS-0069/1	p0270	N81-19464 #
DOE/CS-05438/T1-VOL-1	p0044	N81-11513 #
DOE/CS-05438/T1-VOL-3	p0044	N81-11508 #
DOE/CS-50069/T1	p0638	N81-33201 #
DOE/CS-50069/1	p0074	N81-12051 #
DOE/ER-01388/463	p0257	N81-18359 #
DOE/ER-10570/1	p0135	N81-14363 #
DOE/ET-12293/T1	p0094	N81-13064 #
DOE/ET-15332/T1	p0145	N81-15414 #
DOE/ET-15425/T1	p0134	N81-14327 #
DOE/JPL-1060-46	p0587	N81-30523*#
DOE/JPL-954833-81/3	p0445	N81-25431*#
DOE/LETC/RI-81/1	p0551	N81-29260 #
DOE/NASA/1028-27	p0083	N81-11480*#
DOE/NASA/2593-27	p0381	N81-23203*#
DOE/NASA/9698-2	p0132	N81-14092*#

DOE/NASA/51040-19 .... p0095 N81-13465*#
DOE/NASA/51040-22 .... p0588 N81-30562*#
DOE/OR-05035/T1 .... p0085 N81-12426 #

DOT-TSC-FAA-81-8 .... p0499 N81-27372 #

DOT-TSC-RSPA-80-16-VOL-1 .... p0206 N81-17030 #
DOT-TSC-RSPA-80-16-VOL-2 .... p0207 N81-17031 #
DOT-TSC-RSPA-80-16-VOL-3 .... p0207 N81-17032 #
DOT-TSC-RSPA-80-16-VOL-4 .... p0207 N81-17033 #

DOUGLAS PAPER-6975 .... p0352 A81-31380

DREA-TR-80/J .... p0350 N81-23087 #

DRSMI/RD-80-12-TR .... p0277 N81-19212 #
DRSMI/RG-80-22 .... p0193 N81-16035 #

DRSTE-RP-702-105 .... p0387 N81-23062 #
DRSTE-RP-702-105 .... p0392 N81-23358 #

DTNSRDC-81/009 .... p0601 N81-31233 #
DTNSRDC-81/045 .... p0581 N81-30116 #

DTNSRDC/AERO-1272 .... p0581 N81-30116 #
DTNSRDC/ASED-80/14 .... p0194 N81-16044 #
DTNSRDC/ASED-80/24 .... p0637 N81-33194 #
DTNSRDC/ASED-80/25 .... p0490 N81-26151 #
DTNSRDC/ASED-81/07 .... p0486 N81-26120*#
DTNSRDC/ASED-81/10 .... p0627 N81-32128 #
DTNSRDC/TM-80/16 .... p0252 N81-18054 #

DYTEC-7927-VOL-2 .... p0221 N81-17853 #
DYTEC-7928 .... p0221 N81-17848 #

D3-11536-1 .... p0498 N81-27114*#
D6-41840-1 .... p0139 N81-14970*#
D6-41840-2 .... p0125 N81-13920*#
D6-41840-3 .... p0139 N81-14571*#
D6-41840-4 .... p0185 N81-15977*#
D6-44815-9 .... p0198 N81-16139*#
D6-44815-10 .... p0550 N81-29165*#
D6-46350 .... p0498 N81-27116*#
D6-46691 .... p0332 N81-20062*#
D6-46699 .... p0084 N81-12225*#
D6-48058 .... p0262 N81-19022*#
D6-48609 .... p0378 N81-22129*#
D6-48724 .... p0386 N81-23059*#
D6-48855 .... p0218 N81-17171*#
D6-49228 .... p0579 N81-30084*#
D6-49273 .... p0093 N81-13053 #
D94-10089-2-REV-A .... p0392 N81-23325 #
D180-25725-1 .... p0030 N81-10152 #
D180-26023-1 .... p0273 N81-19113 #
D180-26446-1 .... p0546 N81-29093*#
D194-10074-2 .... p0394 N81-23937 #
D194-10089-1 .... p0381 N81-22571 #
D194-10089-3 .... p0381 N81-22572 #
D194-10089-4 .... p0381 N81-22573 #
D194-10089-5 .... p0632 N81-33136 #
D210-11560-1-VOL-1 .... p0434 N81-24108 #
D210-11569-1-VOL-1 .... p0387 N81-23064*#
D210-11569-2-VOL-2 .... p0387 N81-23065*#
D210-11583-1 .... p0252 N81-18053 #
D210-11591-1 .... p0076 N81-12075 #
D210-11659-1 .... p0033 N81-11014*#
D210-11662-1 .... p0388 N81-23070*#
D210-11676-1 .... p0374 N81-22041 #
D748-10113-4 .... p0492 N81-26849*#
D2536-941001 .... p0278 N81-19479*#
D2536-941002 .... p0279 N81-19480*#
D2536-941003 .... p0279 N81-19481*#
D2536-941004 .... p0279 N81-19482*#
D2536-941005 .... p0279 N81-19483*#

E-396 .... p0036 N81-11039*#
E-417 .... p0078 N81-12089*#
E-449 .... p0336 N81-20245*#
E-455 .... p0036 N81-11038*#
E-461 .... p0155 N81-16050*#
E-468 .... p0345 N81-21685*#
E-477 .... p0078 N81-12090*#
E-481 .... p0096 N81-13568*#
E-495 .... p0393 N81-23486*#
E-540 .... p0334 N81-20076*#
E-558 .... p0146 N81-15768*#
E-561 .... p0028 N81-10067*#
E-567 .... p0043 N81-11448*#
E-568 .... p0140 N81-14979*#
E-569 .... p0032 N81-10087*#
E-574 .... p0140 N81-14980*#
E-575 .... p0543 N81-29063*#
E-580 .... p0043 N81-11412*#
E-598 .... p0044 N81-11680*#
E-607 .... p0044 N81-11769*#
E-612 .... p0140 N81-14970*#
E-616 .... p0044 N81-11770*#
E-617 .... p0436 N81-24283*#
E-623 .... p0550 N81-29205*#
E-633 .... p0085 N81-12446*#
E-645 .... p0093 N81-13056*#
E-651 .... p0140 N81-14977*#
E-666 .... p0428 N81-24063*#
E-673 .... p0342 N81-21070*#
E-674 .... p0195 N81-16053*#
E-676 .... p0588 N81-30562*#
E-680 .... p0195 N81-16054*#
E-681 .... p0195 N81-16055*#
E-686 .... p0195 N81-16052*#
E-693 .... p0191 N81-16021*#
E-700 .... p0220 N81-17480*#
E-708 .... p0201 N81-16388*#
E-733 .... p0641 N81-33947*#
E-736 .... p0269 N81-19078*#
E-744 .... p0391 N81-23243*#
E-768 .... p0380 N81-22836*#
E-770 .... p0337 N81-2[illegible]20*#
E-787 .... p0345 N81-21693*#
E-791 .... p0381 N81-22[illegible]*#
E-799 .... p0338 N81-210[illegible]*#
E-804 .... p0447 N81-2576[illegible]*#
E-815 .... p0376 N81-2205[illegible]*#
E-821 .... p0380 N81-22838*#
E-822 .... p0443 N81-25084*#
E-824 .... p0443 N81-25079*#
E-845 .... p0597 N81-31196*#
E-847 .... p0390 N81-23005*#
E-851 .... p0444 N81-25232*#
E-855 .... p0489 N81-26185*#
E-869 .... p0443 N81-25081*#
E-880 .... p0443 N81-25083*#
E-889 .... p0446 N81-25698*#
E-891 .... p0490 N81-26146*#
E-895 .... p0443 N81-25082*#
E-904 .... p0539 N81-28095*#
E-911 .... p0443 N81-25080*#
E-917 .... p0597 N81-31190*#
E-923 .... p0496 N81-27094*#
E-926 .... p0552 N81-29782*#
E-934 .... p0551 N81-29206*#
E-938 .... p0496 N81-27095*#
E-942 .... p0492 N81-27062*#
E-970 .... p0589 N81-30907*#
E-979 .... p0597 N81-31195*#
E-984 .... p0583 N81-30130*#
E-2239 .... p0211 N81-17059*#
E-9356-1 .... p0090 N81-13019*#
E-9356-3 .... p0095 N81-13465*#
E-9542 .... p0035 N81-11037*#

ECAC-CR-79-127 .... p0025 N81-10039 #
ECAC-CR-80-044 .... p0219 N81-17342 #

ECAC-PR-77-031 .... p0339 N81-21088 #
ECAC-PR-77-061 .... p0024 N81-10034 #
ECAC-PR-80-008 .... p0206 N81-17025 #
ECAC-PR-80-012 .... p0206 N81-17026 #

EDR-984 .... p0439 N81-25067 #

EDR-010-047 .... p0209 N81-17067 #
EDR-10156 .... p0274 N81-19110*#
EDR-10361-VOL-2 .... p0140 N81-14976*#

ERR-48-1 .... p0440 N81-25061 #
ERR-48-2 .... p0491 N81-26294 #

EIR-00733 .... p0077 N81-12092

ENW-00432 .... p0033 N81-11020 #

ENDEAVOR-302 .... p0144 N81-15[illegible] #

EPA-550/9-70-313-2 .... p0087 N81-12645 #
EPA-550/9-79-313-1 .... p0087 N81-12644 #
EPA-600/2-80-068 .... p0344 N81-21165 #
EPA-600/4-79-070 .... p0096 N81-13555 #
EPA-600/4-81-005 .... p0495 N81-27[illegible] #

EPA-600/9-80-035	p0560	N81-30700	#
EPA-600/9-81-009	p0566	N81-30313	#
ER-8174-F	p0442	N81-25076*	#
ER-15047	p0035	N81-11034	#
ERIB-138300-57-T	p0194	N81-16047	#
ESA-TT-532	p0382	N81-23008	#
ESA-TT-558	p0022	N81-10017	#
ESA-TT-585	p0022	N81-10018	#
ESA-TT-625	p0197	N81-16069	#
ESA-TT-627	p0086	N81-12536	#
ESA-TT-630	p0276	N81-19135	#
ESA-TT-631	p0077	N81-12080	#
ESA-TT-633	p0344	N81-21340	#
ESA-TT-634	p0339	N81-21046	#
ESA-TT-639	p0088	N81-12826	#
ESA-TT-641	p0339	N81-21041	#
ESA-TT-648	p0500	N81-27893	#
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L-14114	p0145	N81-15397*#
L-14117	p0423	N81-24022*#
L-14125	p0437	N81-24471*#
L-14160	p0329	N81-20025*#
L-14174	p0335	N81-20083*#
L-14190	p0337	N81-21016*#
L-14198	p0335	N81-20084*#
L-14205	p0345	N81-21873*#
L-14209	p0427	N81-24058*#
L-14213	p0329	N81-20026*#
L-14215	p0146	N81-15702*#
L-14254	p0264	N81-19035*#
L-14254	p0267	N81-19056*#
L-14257	p0380	N81-22832*#
L-14278	p0259	N81-19001*#
L-14330	p0331	N81-20050*#
L-14344	p0435	N81-24115*#
L-14354	p0339	N81-21044*#
L-14355	p0589	N81-30851*#
L-14374	p0631	N81-32966*#
L-14392	p0547	N81-29119*#
L-14395	p0446	N81-25765*#
L-14415	p0579	N81-30088*#
L-14418	p0546	N81-29109*#
L-14433	p0635	N81-33159*#
L-14468	p0345	N81-21904*#
L-14516	p0483	N81-26078*#
L-14521	p0641	N81-33946*#
L-14531	p0579	N81-30086*#
L-14543	p0635	N81-33158*#
L-14546	p0579	N81-30087*#
L-14549	p0581	N81-30112*#
L-14590	p0638	N81-33203*#
L-14600	p0641	N81-33945*#
L-14652	p0639	N81-33211*#
LA-UR-80-2485	p0135	N81-14550 #
LC-80-23303	p0132	N81-14382 #
LC-80-82605	p0270	N81-19083 #
LC-80-6000205	p0336	N81-20323 #
LC-80-6000206	p0336	N81-20322 #
LC-81-9570	p0637	N81-33188 #
LCD-80-65	p0487	N81-26125 #
LCD-80-89	p0389	N81-23079 #
LBBSCO-16941	p0629	N81-32143*#
LG80ER0006-VOL-1	p0027	N81-10056 #
LG80ER0007-VOL-2	p0027	N81-10057 #
LG80ER0008-VOL-3	p0027	N81-10058 #
LG80ER0009-VOL-4	p0027	N81-10059 #
LG80ER0013-VOL-1	p0331	N81-20047 #
LG80ER0013-VOL-2	p0331	N81-20046 #
LG80ER0035	p0142	N81-14994*#
LG80ER0112	p0193	N81-16041*#
LG80ER0144	p0272	N81-19105 #
LG81ER0074	p0142	N81-14993*#

LG81ER0162 .... p0589 N81-30908*#

LMSC-D767313 .... p0339 N81-21051 #

LMSC-HREC-TR-D697882 .... p0201 N81-16416*#

LOG-C3932 .... p0072 N81-12020 #

LR-28568 .... p0277 N81-19232*#
LR-29540 .... p0378 N81-22419*#
LR-29623 .... p0342 N81-21079*#

LMP-939 .... p0272 N81-19099*#

LYC-78-36 .... p0274 N81-19120*#
LYC-80-27 .... p0629 N81-32147*#
LYC-80-55 .... p0444 N81-25085 #
LYC-80-73 .... p0274 N81-19123 #

MAE-1466 .... p0596 N81-31188 #

MBB-FE-2/S/PUB/26 .... p0131 N81-14006 #
MBB-FE-17/S/PUB/24 .... p0131 N81-13572 #
MBB-FE-17/S/PUB/25 .... p0131 N81-13573 #
MBB-FE-17/S/PUB/27 .... p0131 N81-13574 #
MBB-FE-17/S/PUB/42 .... p0608 A81-47556
MBB-FE-122/S/PUB/13 .... p0128 N81-13950 #
MBB-FE-122/S/PUB/16 .... p0203 N81-16587 #
MBB-FE-122/S/PUB/17 .... p0220 N81-17483 #
MBB-FE-122/S/PUB/41 .... p0608 A81-47557
MBB-FE-123/S/PUB/20 .... p0203 N81-16588 #
MBB-FE-127/S/PUB/23 .... p0495 N81-27085 #
MBB-FE-172/S/PUB/39 .... p0608 A81-47552

MBB-FE122 .... p0121 A81-19400 #

MBB-PUB-F-0001 .... p0251 N81-18048 #

MBB-S/PUB/32 .... p0582 N81-30122 #

MBB-UA-528-80-OE .... p0276 N81-19140 #
MBB-UA-549/80-OE .... p0585 N81-30143 #

MBB-UD-274/79-OE .... p0582 N81-30121 #
MBB-UD-275-79-O p0018 A81-12097
MBB-UD-276-79-O p0018 A81-12094
MBB-UD-277-79-O p0018 A81-12096
MBB-UD-301/80-OE .... p0586 N81-30198 #
MBB-UD-304/80-OE .... p0586 N81-30199 #
MBB-UD-305/80-OE .... p0582 N81-30123 #
MBB-UD-306/80-OE .... p0584 N81-30139 #
MBB-UD-307/80-OE .... p0584 N81-30140 #
MBB-UD-308/80-OE .... p0587 N81-30485 #
MBB-UD-309/80-OE .... p0580 N81-30105 #
MBB-UD-311-80-O .... p0119 A81-19300 #
MBB-UD-312-80-OE .... p0449 A81-37636 #
MBB-UD-314/80-OE .... p0583 N81-30125 #
MBB-UD-320-81-OE .... p0608 A81-47554 #
MBB-UD-321-81-OE .... p0608 A81-47555 #

MBB-UT-07-81 .... p0607 A81-47551 #
MBB-UT-08-81 .... p0608 A81-47553

MBB-278-79-O p0018 A81-12095

MDC-J4649 .... p0190 N81-16020*#
MDC-J4665 .... p0386 N81-23058*#
MDC-J4673-VOL-2 .... p0440 N81-25050*#
MDC-J7191 .... p0492 N81-26847 #

MDC-Q0722 .... p0593 N81-31153 #

ME-RT-81003 .... p0444 N81-25089*#

MHSMP-80-20 .... p0144 N81-15148 #

MIT-TR-207 .... p0336 N81-20086*#

MIT/LMP/TRB-80-2 .... p0132 N81-14064 #

MRC-DA-934 .... p0083 N81-12191 #

MSSU-EIRS-ASE-81-3 .... p0186 N81-15586*#
MSSU-EIRS-ASE-81-3 .... p0251 N81-18046*#
MSSU-EIRS-ASE-81-4 .... p0196 N81-16058*#

MTP-6-3-024 .... p0201 N81-16375 #
MTP-6-3-025 .... p0201 N81-16375 #

MTR-79W00158 .... p0340 N81-210
MTR-79W00235-VOL-1 .... p0250 N81-180
MTR-79W00235-VOL-2 .... p0250 N81-180
MTR-79W00415 .... p0024 N81-100
MTR-80W301 .... p0425 N81-240
MTR-80W302 .... p0581 N81-301
MTR-80W00100-REV-1 .... p0250 N81-180
MTR-81W16-VOL-1 .... p0639 N81-332
MTR-81W16-VOL-2 .... p0639 N81-332
MTR-81W49 .... p0440 N81-250

M78-75 .... p0340 N81-210

NA-80-247 .... p0045 N81-117
NA-80-333 .... p0200 N81-162
NA-81-110 .... p0269 N81-190

NAC/FR-3037/01 .... p0640 N81-333
NAC/FR-3030/01 .... p0219 N81-173

NADC-13920-2 .... p0334 N81-200
NADC-13920-2 .... p0596 N81-311
NADC-75353-60 .... p0439 N81-250
NADC-77108-30 .... p0388 N81-230
NADC-77318-60 .... p0638 N81-331
NADC-79095-60 .... p0218 N81-172
NADC-79119-60 .... p0072 N81-120
NADC-79125-60 .... p0216 N81-171
NADC-79133-60-VOL-2 .... p0028 N81-100
NADC-79133-60-VOL-3 .... p0028 N81-100
NADC-79199-60 .... p0277 N81-193
NADC-79239-60-VOL-1 .... p0252 N81-180
NADC-79239-60-VOL-2 .... p0252 N81-180
NADC-79256-60 .... p0548 N81-291
NADC-80046-60 .... p0039 N81-111
NADC-80081-60 .... p0091 N81-130
NADC-80094-60 .... p0216 N81-170
NADC-80109-60 .... p0208 N81-170
NADC-80205-60 .... p0385 N81-230
NADC-80207-60 .... p0392 N81-232
NADC-80208-60 .... p0191 N81-168
NADC-80232-60 .... p0424 N81-2403
NADC-80246-60 .... p0441 N81-250
NADC-81031-60 .... p0540 N81-281
NADC-81049-50 .... p0597 N81-311
NADC-81051-60 .... p0486 N81-2611
NADC-81065-60 .... p0636 N81-3317
NADC-81066-60 .... p0628 N81-3213
NADC-81165-60 .... p0628 N81-321
NADC-81186-60 .... p0629 N81-321

NAE-LR-600 .... p0084 N81-123
NAE-LR-601 .... p0208 N81-170
NAE-LR-604 .... p0547 N81-291
NAE-LR-605 .... p0390 N81-230

NAE-LTR-HA-43 .... p0298 A81-291

NAEC-MISC-91-OR019 .... p0341 N81-2106

NAEC-91-7983 .... p0269 N81-190
NAEC-92-143 .... p0220 N81-174
NAEC-92-146 .... p0550 N81-291

NAL-TR-602T p0141 N81-14
NAL-TR-617T p0090 N81-130
NAL-TR-622 .... p0141 N81-14
NAL-TR-631 .... p0337 N81-210
NAL-TR-649T p0639 N81-332
NAL-TR-665 .... p0627 N81-321

NAMRL-SR-80-4 .... p0208 N81-170

NASA-CASE-ARC-11312-1 .... p0278 N81-15

NASA-CASE-FRC-11029-1 .... p0210 N81-17
NASA-CASE-FRC-11043-1 .... p0375 N81-220
NASA-CASE-FRC-11065-1 .... p0426 N81-2

NASA-CASE-GSC-12550-1 .... p0378 N81-

NASA-CASE-KSC-11042-1 .... p0138 N81-

NASA-CASE-LAR-11695-2 .... p0437 N81-
NASA-CASE-LAR-11797-1 .... p0270 N81-190
NASA-CASE-LAR-11970-2 .... p0275 N81-19
NASA-CASE-LAR-12136-1 .... p0639 N81-33
NASA-CASE-LAR-12268-1 .... p0433 N81-

NASA-CASE-LAR-12326-1	p0139	N81-14960*
NASA-CASE-LAR-12406-1	p0485	N81-26110*
NASA-CASE-LAR-12450-1	p0601	N81-31230*#
NASA-CASE-LAR-12544-1	p0496	N81-27096*#
NASA-CASE-LAR-12562-1	p0490	N81-26152*
NASA-CASE-LAR-12615-1	p0628	N81-32130*#
NASA-CASE-LAR-12624-1	p0546	N81-29107*#
NASA-CASE-LAR-12720-1	p0601	N81-31229*#
NASA-CASE-LAR-12750-1	p0261	N81-19016*#
NASA-CASE-LAR-12883-1	p0550	N81-29138*#
NASA-CASE-LEW-12594-2	p0274	N81-19116*
NASA-CASE-LEW-12907-2	p0273	N81-19115*
NASA-CASE-LEW-12990-1	p0549	N81-29129*
NASA-CASE-LEW-13201-1	p0143	N81-14999*
NASA-CASE-MSC-12631-3	p0132	N81-14077*
NASA-CASE-NPO-14220-1	p0133	N81-14318*
NASA-CASE-NPO-15264-1	p0373	N81-22036*#
NASA-CASE-NPO-15351-1	p0202	N81-16677*#
NASA-CP-2108-PT-1	p0243	N81-17981*#
NASA-CP-2108-PT-2	p0246	N81-18005*#
NASA-CP-2137	p0078	N81-12090*#
NASA-CP-2139	p0135	N81-14555*#
NASA-CP-2167	p0146	N81-15702*#
NASA-CP-2170-PT-1	p0264	N81-19035*#
NASA-CP-2170-PT-2	p0267	N81-19056*#
NASA-CP-2172	p0259	N81-19001*#
NASA-CP-2178	p0428	N81-24063*#
NASA-CP-2184	p0580	N81-30101*#
NASA-CP-2190	p0597	N81-31196*#
NASA-CR-2948	p0262	N81-19023*#
NASA-CR-3005	p0071	N81-12014*#
NASA-CR-3062	p0262	N81-19022*#
NASA-CR-3119	p0492	N81-27046*#
NASA-CR-3149	p0203	N81-16854*#
NASA-CR-3170	p0090	N81-13022*#
NASA-CR-3226	p0134	N81-14347*#
NASA-CR-3305	p0332	N81-20062*#
NASA-CR-3311	p0125	N81-13523*#
NASA-CR-3342	p0031	N81-10636*#
NASA-CR-3351	p0139	N81-14970*#
NASA-CR-3352	p0125	N81-13520*#
NASA-CR-3353	p0139	N81-14971*#
NASA-CR-3354	p0185	N81-15577*#
NASA-CR-3355	p0080	N81-12105*#
NASA-CR-3357	p0072	N81-12022*#
NASA-CR-3369	p0201	N81-16416*#
NASA-CR-3379	p0202	N81-16681*#
NASA-CR-3403	p0279	N81-19484*#
NASA-CR-3405	p0372	N81-22615*#
NASA-CR-3406	p0345	N81-21871*#
NASA-CR-3409	p0343	N81-21086*#
NASA-CR-3418	p0378	N81-22129*#
NASA-CR-3422	p0378	N81-22130*#
NASA-CR-3426	p0442	N81-25075*#
NASA-CR-3427	p0446	N81-25766*#
NASA-CR-3429	p0393	N81-23487*#
NASA-CR-3431	p0438	N81-24679*#
NASA-CR-3433	p0392	N81-23411*#
NASA-CR-3435	p0491	N81-26846*#
NASA-CR-3436	p0434	N81-24112*#
NASA-CR-3444	p0587	N81-30392*#
NASA-CR-3451	p0600	N81-31224*#
NASA-CR-3454	p0589	N81-30908*#
NASA-CR-3460	p0635	N81-33160*#
NASA-CR-3461-VOL-1	p0595	N81-31171*#
NASA-CR-3464	p0637	N81-33191*#
NASA-CR-135117	p0497	N81-27097*#
NASA-CR-135386	p0274	N81-19119*#
NASA-CR-145370	p0277	N81-19232*#
NASA-CR-152087-PT-1	p0271	N81-19096*#
NASA-CR-152088-PT-2	p0271	N81-19097*#
NASA-CR-152119	p0254	N81-18097*#
NASA-CR-152124	p0423	N81-24023*#
NASA-CR-152145	p0276	N81-19136*#
NASA-CR-152149	p0273	N81-19111*#
NASA-CR-152174	p0261	N81-19017*#
NASA-CR-152179	p0273	N81-19112*#
NASA-CR-152251	p0249	N81-18028*#
NASA-CR-152254	p0261	N81-19018*#
NASA-CR-152292	p0218	N81-17175*#
NASA-CR-152303-VOL-1-PT-1	p0270	N81-19088*#
NASA-CR-152303-VOL-2-PT-1	p0270	N81-19089*#
NASA-CR-152303-VOL-3-PT-1	p0270	N81-19090*#
NASA-CR-152303-VOL-4-PT-1	p0271	N81-19091*#
NASA-CR-152303-VOL-5-PT-1	p0271	N81-19092*#
NASA-CR-152303-VOL-6-PT-1	p0271	N81-19093*#
NASA-CR-152303-VOL-7-PT-1	p0271	N81-19094*#
NASA-CR-152306	p0081	N81-12110*#
NASA-CR-152316	p0251	N81-18045*#
NASA-CR-152320	p0375	N81-22047*#
NASA-CR-152321	p0271	N81-19095*#
NASA-CR-152329	p0258	N81-18798*#
NASA-CR-152331	p0251	N81-18044*#
NASA-CR-152336-1	p0387	N81-23064*#
NASA-CR-152336-2	p0387	N81-23065*#
NASA-CR-152351	p0249	N81-18027*#
NASA-CR-152356	p0220	N81-17623*#
NASA-CR-152357-VOL-2	p0220	N81-17624*#
NASA-CR-152361	p0278	N81-19412*#
NASA-CR-152373	p0033	N81-11014*#
NASA-CR-152378	p0333	N81-20063*#
NASA-CR-152380	p0483	N81-26076*#
NASA-CR-152390	p0023	N81-10019*#
NASA-CR-152391-VOL-1	p0384	N81-23030*#
NASA-CR-152391-VOL-2	p0384	N81-23031*#
NASA-CR-152391-VOL-3	p0384	N81-23032*#
NASA-CR-152391-VOL-4	p0384	N81-23033*#
NASA-CR-152399	p0253	N81-18060*#
NASA-CR-152401	p0143	N81-14998*
NASA-CR-152403	p0337	N81-21010*#
NASA-CR-152405	p0389	N81-23080*#
NASA-CR-152408	p0386	N81-23058*#
NASA-CR-152409	p0075	N81-12054*#
NASA-CR-156170	p0344	N81-21211*#
NASA-CR-156871	p0343	N81-21084*#
NASA-CR-156872	p0137	N81-14601*#
NASA-CR-158930	p0071	N81-12016*#
NASA-CR-158954	p0084	N81-12225*#
NASA-CR-159005	p0262	N81-19021*#
NASA-CR-159010	p0498	N81-27116*#
NASA-CR-159060	p0494	N81-27077*#
NASA-CR-159062	p0494	N81-27078*#
NASA-CR-159081	p0379	N81-22722*#
NASA-CR-159082	p0379	N81-22723*#
NASA-CR-159083	p0380	N81-22724*#
NASA-CR-159084	p0380	N81-22725*#
NASA-CR-159085	p0380	N81-22726*#
NASA-CR-159112	p0194	N81-16042*#
NASA-CR-159195	p0434	N81-24111*#
NASA-CR-159211	p0218	N81-17171*#
NASA-CR-159221	p0543	N81-28783*#
NASA-CR-159262	p0333	N81-20067*#
NASA-CR-159283	p0340	N81-21059*#
NASA-CR-159296	p0378	N81-22419*#
NASA-CR-159297	p0271	N81-19098*#
NASA-CR-159320	p0127	N81-13941*#
NASA-CR-159330	p0142	N81-14993*#
NASA-CR-159331	p0142	N81-14994*#
NASA-CR-159355	p0193	N81-16041*#
NASA-CR-159361	p0032	N81-11013*#
NASA-CR-159362	p0343	N81-21131*#
NASA-CR-159363	p0258	N81-18799*#
NASA-CR-159365	p0249	N81-18033*#
NASA-CR-159370	p0590	N81-30962*#
NASA-CR-159371	p0197	N81-16066*#
NASA-CR-159372	p0083	N81-12120*#
NASA-CR-159381	p0185	N81-15974*#
NASA-CR-159382	p0071	N81-12019*#
NASA-CR-159387	p0249	N81-18032*#
NASA-CR-159426	p0274	N81-19120*#
NASA-CR-159482	p0274	N81-19117*#
NASA-CR-159498	p0195	N81-16051*#
NASA-CR-159499	p0078	N81-12086*#
NASA-CR-159562	p0078	N81-12088*#
NASA-CR-159584	p0375	N81-22051*#
NASA-CR-159662	p0497	N81-27098*#
NASA-CR-159678	p0132	N81-14082*#
NASA-CR-159728	p0278	N81-19479*#
NASA-CR-159816	p0093	N81-13057*#
NASA-CR-159819-VOL-1	p0214	N81-17081*#
NASA-CR-159819-VOL-2-BK-1	p0214	N81-17082*#
NASA-CR-159819-VOL-2-BK-2	p0214	N81-17083*#
NASA-CR-159819-VOL-2-BK-3	p0214	N81-17084*#
NASA-CR-159819-VOL-3-BK-1	p0214	N81-17085*#
NASA-CR-159819-VOL-3-BK-2	p0214	N81-17086*#
NASA-CR-159823	p0279	N81-19480*#
NASA-CR-159824	p0279	N81-19481*#
NASA-CR-159825	p0279	N81-19482*#
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NASA-CR-159865	p0274	N81-19118*#
NASA-CR-159867	p0078	N81-12085*#
NASA-CR-159869	p0220	N81-17046*#
NASA-CR-159879	p0078	N81-12087*#

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NASA-CR-160036	p0023	N81-10020*#
NASA-CR-160909	p0190	N81-16020*#
NASA-CR-160963	p0440	N81-25050*#
NASA-CR-160995-VOL-1	p0440	N81-25051*#
NASA-CR-161074	p0602	N81-31421*#
NASA-CR-161089	p0629	N81-32143*#
NASA-CR-163093	p0377	N81-22059*#
NASA-CR-163097	p0130	N81-13969*#
NASA-CR-163099	p0092	N81-13044*#
NASA-CR-163105	p0207	N81-17038*#
NASA-CR-163106	p0342	N81-21079*#
NASA-CR-163108	p0458	N81-27113*#
NASA-CR-163112	p0540	N81-28102*#
NASA-CR-163656	p0026	N81-10049*#
NASA-CR-163675	p0028	N81-10065*#
NASA-CR-163684	p0038	N81-11117*#
NASA-CR-163744	p0088	N81-12943*#
NASA-CR-163747	p0087	N81-12646*#
NASA-CR-163824	p0137	N81-14789*#
NASA-CR-163833	p0129	N81-13957*#
NASA-CR-163833	p0129	N81-13957*#
NASA-CR-163837	p0125	N81-13917*#
NASA-CR-163850	p0141	N81-14589*#
NASA-CR-163855	p0143	N81-15001*#
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NASA-TP-1844	p0546	N81-29111*#
NASA-TP-1845	p0392	N81-23410*#
NASA-TP-1854	p0427	N81-24058*#
NASA-TP-1855	p0426	N81-24048*#
NASA-TP-1858	p0380	N81-22832*#
NASA-TP-1861	p0423	N81-24022*#
NASA-TP-1863	p0437	N81-24471*#
NASA-TP-1871	p0489	N81-26144*#
NASA-TP-1875	p0594	N81-31162*#
NASA-TP-1876	p0589	N81-30851*#
NASA-TP-1877	p0581	N81-30112*#
NASA-TP-1881	p0483	N81-26070*#
NASA-TP-1885	p0546	N81-29109*#
NASA-TP-1889	p0579	N81-30087*#
NASA-TP-1890	p0579	N81-30086*#
NASA-TP-1892	p0579	N81-30088*#
NASA-TP-1898	p0641	N81-33945*#
NASA-TP-1904	p0641	N81-33946*#
NASA-TP-1913	p0641	N81-33947*#
NASA-TP-1915	p0638	N81-33203*#
NASA-TP-1921	p0596	N81-31185*#

NAVAIR-518-1	p0341	N81-21069
NAVTRAEQUIPC-IH-321	p0601	N81-31232
NAVTRAEQUIPC-IH-322	p0192	N81-16833
NAVTRAEQUIPC-78-C-0076-1	p0198	N81-16078
NEAR-TR-158	p0071	N81-1201[illegible]
NEAR-TR-161	p0251	N81-180[illegible]
NEAR-TR-183	p0261	N81-19010
NEAR-TR-187	p0251	N81-18045
NEAR-TR-210-VOL-1	p0495	N81-27081
NEAR-TR-210-VOL-2	p0494	N81-27080
NEAR-TR-210-VOL-3	p0495	N81-27082
NEAR-TR-210-VOL-4	p0495	N81-27083
NEAR-TR-222	p0263	N81-19030
NEAR-TR-226	p0594	N81-31154
NEAR-TR-228	p0085	N81-12451
NEAR-TR-230	p0261	N81-19020
NF-86/8-79	p0437	N81-24309
NGTE-R78029	p0031	N81-10436
NGTE-R78031	p0031	N81-10436
NIAST-80/19	p0435	N81-24116
NIAST-80/52	p0434	N81-24107
NLR-MP-78013-U	p0256	N81-18325
NLR-MP-79013-U	p0022	N81-10012
NLR-MP-79020-U	p0338	N81-21038
NLR-MP-79038-U	p0332	N81-20059
NLR-MP-79039-U	p0596	N81-31189
NLR-MP-79042-U	p0077	N81-12081
NLR-MP-79044-U	p0086	N81-12475
NLR-MP-80003-U	p0043	N81-11415
NLR-MP-80003-U	p0086	N81-12477
NLR-MP-80004-U	p0330	N81-20038
NLR-MP-80005-U	p0330	N81-20039
NLR-MP-80010-U	p0339	N81-21042
NLR-MP-80024-U	p0600	N81-31222
NLR-MP-80025-U	p0496	N81-27087
NLR-MP-80027-U	p0630	N81-32164
NLR-TR-77104-U	p0073	N81-12033
NLR-TR-78106-U	p0139	N81-14969
NLR-TR-78150-U	p0495	N81-27086
NLR-TR-79009-U	p0022	N81-10014
NLR-TR-79056-U	p0344	N81-21391
NLR-TR-79127-U	p0498	N81-27118
NLR-TR-80078-U	p0594	N81-31157
NOAA-81020304	p0552	N81-29722
NOSC/TR-591	p0221	N81-17902
NOSC/TR-646	p0484	N81-26086
NPL-AC-93	p0138	N81-14792
NPS53-81-001	p0202	N81-16825
NPS54-79-019	p0341	N81-21067
NPS67-80-014	p0254	N81-18067
NPS67-80-018	p0537	N81-28060
NRC-18227	p0084	N81-12394
NRC-18629	p0208	N81-17083
NRC-19164	p0390	N81-23008
NRC-19271	p0547	N81-29116
NRL-MR-4385	p0202	N81-16770
NRL-MR-4401	p0393	N81-23466
NRL-8445	p0272	N81-19103
NRL-8480	p0495	N81-27084
NR80H-102-VOL-1	p0337	N81-21017
NR80H-102-VOL-2	p0337	N81-21018
NR81H-2	p0388	N81-23075
NSWC/TR-80-208	p0091	N81-13036
NSWC/TR-80-216	p0038	N81-11117
NSWC/TR-80-271	p0033	N81-11017
NTIA/REPT-80-53	p0441	N81-25[illegible]
NTIS/PS-78/0539	p0023	N81-10[illegible]
NTIS/PS-78/0685	p0030	N81-1000[illegible]
NTIS/PS-78/0694	p0024	N81-10[illegible]

NTIS/PS-78/0731 p0128 N81-13948 #
NTIS/PS-78/0732 p0128 N81-13947 #
NTIS/PS-78/0788 p0207 N81-17037 #
NTIS/PS-78/0887 p0088 N81-12667 #
NTIS/PS-78/0809 p0082 N81-12114 #
NTIS/PS-78/0883 p0193 N81-16038 #
NTIS/PS-78/0930 p0135 N81-14525 #
NTIS/PS-79/0649 p0023 N81-10026 #
NTIS/PS-79/0753 p0024 N81-10027 #
NTIS/PS-79/0754 p0030 N81-10083 #
NTIS/PS-79/0777 p0128 N81-13948 #
NTIS/PS-79/0778 p0128 N81-13947 #
NTIS/PS-79/0799 p0207 N81-17037 #
NTIS/PS-79/0858/5 p0146 N81-15649*#
NTIS/PS-79/0859/3 p0125 N81-13917*#
NTIS/PS-79/0875/9 p0142 N81-14996*#
NTIS/PS-79/0878 p0088 N81-12667 #
NTIS/PS-79/0904 p0082 N81-12114 #
NTIS/PS-79/0960 p0193 N81-16038 #
NTIS/PS-79/0973 p0135 N81-14525 #
NTIS/PS-79/1017 p0129 N81-13957*#

NTSB-AAR-79-12 p0073 N81-12044 #
NTSB-AAR-79-14 p0074 N81-12045 #
NTSB-AAR-79-15 p0074 N81-12046 #
NTSB-AAR-80-10 p0073 N81-12042 #
NTSB-AAR-81-1 p0269 N81-19077 #

NTSB-AAS-80-1 p0141 N81-14988 #

NTSB-AMM-80-1 p0205 N81-16999 #
NTSB-AMM-80-5 p0192 N81-16028 #
NTSB-AMM-80-11 p0141 N81-14987 #

NTSB-ARG-80-1 p0024 N81-10028 #

NTSB-BA-80-8 p0075 N81-12053 #

NTSB-SR-80-2 p0484 N81-26084 #

NWC-TP-6184 p0132 N81-14080 #
NWC-TP-6210 p0263 N81-19030 #
NWC-TP-6211 p0197 N81-16070 #
NWC-TP-6218 p0127 N81-13938 #

N122 p0394 N81-23966 #
N125 p0394 N81-23967 #

ONERA-NT-1979-4 p0088 N81-12826 #
ONERA-NT-1979-5 p0344 N81-21340 #
ONERA-NT-1979-8 p0339 N81-21086 #
ONERA-NT-1980-4 p0126 N81-13930 #

ONERA, TP NO. 1978-106 p0058 A81-14391 #
ONERA, TP NO. 1980-122 p0017 A81-11520 #
ONERA, TP NO. 1980-125 p0011 A81-11638
ONERA, TP NO. 1980-126 p0015 A81-11674
ONERA, TP NO. 1980-127 p0009 A81-11623
ONERA, TP NO. 1980-129 p0014 A81-11669
ONERA, TP NO. 1980-149 p0174 A81-21517 #
ONERA, TP NO. 1980-154 p0123 A81-19552 #
ONERA, TP NO. 1981-4 p0150 A81-20559 #
ONERA, TP NO. 1981-7 p0296 A81-29107 #
ONERA, TP NO. 1981-12 p0359 A81-32541 #
ONERA, TP NO. 1981-17 p0359 A81-32534 #
ONERA, TP NO. 1981-31 p0351 A81-31265
ONERA, TP NO. 1981-35 p0460 A81-39230 #
ONERA, TP NO. 1981-36 p0460 A81-39239 #
ONERA, TP NO. 1981-37 p0460 A81-39248 #
ONERA, TP NO. 1981-39 p0460 A81-39242 #
ONERA, TP NO. 1981-42 p0460 A81-39245 #

ONR-CR-212-266-1 p0441 N81-25068 #
ONR-CR-215-262-1F p0596 N81-31188 #

OR-16127 p0091 N81-13040 #

OUEL-1321/80 p0435 N81-24119 #

PAPER 810610 p0522 A81-42766

PAPER-ER-35 p0031 N81-10454 #

PAPER-16 p0621 N81-32522 #

PAR-010-81 p0630 N81-32150 #
PAR-037-80 p0095 N81-13072 #

PATR-1080-80-6 p0211 N81-17061 #

PB80-201916 p0024 N81-10028 #
PB80-213113 p0096 N81-13555 #
PB80-215584 p0125 N81-13916 #
PB80-215635 p0132 N81-14182 #
PB80-218233 p0128 N81-13949 #
PB80-225691 p0129 N81-13956 #
PB80-808546 p0026 N81-10048 #
PB80-808603 p0031 N81-10441 #
PB80-808611 p0029 N81-10076 #
PB80-809023 p0028 N81-10065*#
PB80-809064 p0026 N81-10050 #
PB80-809072 p0026 N81-10049*#
PB80-812037 p0023 N81-10026 #
PB80-812060 p0030 N81-10083 #
PB80-812946 p0024 N81-10027 #
PB80-813231 p0088 N81-12667 #
PB80-813710 p0082 N81-12114 #
PB80-814635 p0128 N81-13948 #
PB80-814643 p0128 N81-13947 #
PB80-815020 p0193 N81-16038 #
PB80-815566 p0135 N81-14525 #
PB80-815889 p0146 N81-15649*#
PB80-815921 p0142 N81-14996*#
PB80-815947 p0146 N81-15648*#
PB81-101701 p0141 N81-14987 #
PB81-104267 p0141 N81-14988 #
PB81-110280 p0205 N81-16999 #
PB81-110827 p0192 N81-16028 #
PB81-114886 p0270 N81-19083 #
PB81-134686 p0381 N81-22969*#
PB81-136186 p0344 N81-21165 #
PB81-137473 p0389 N81-23079 #
PB81-144180 p0389 N81-23078 #
PB81-150021 p0392 N81-23269 #
PB81-154387 p0441 N81-25062 #
PB81-160798 p0484 N81-26084 #
PB81-160814 p0487 N81-26125 #
PB81-166159 p0487 N81-26124 #
PB81-166167 p0487 N81-26123 #
PB81-166183 p0487 N81-26122 #
PB81-168734 p0499 N81-27714 #
PB81-174252 p0493 N81-27068 #
PB81-176067 p0588 N81-30700 #
PB81-176596 p0552 N81-29722 #
PB81-183477 p0586 N81-30313 #
PB81-210130 p0641 N81-34108 #
PB81-211757 p0641 N81-34109 #
PB81-215246 p0637 N81-33188 #
PB81-800104 p0207 N81-17037 #
PB81-910401 p0269 N81-19077 #

PCRP-2 p0497 N81-27090*#

PH-TRADE-RR-0012 p0146 N81-15729 #

PML-1976-22 p0436 N81-24213 #

PNR-90013 p0072 N81-12029 #
PNR-90017 p0335 N81-20081 #
PNR-90018 p0088 N81-12825 #
PNR-90019 p0084 N81-12209
PNR-90021 p0029 N81-10075 #
PNR-90022 p0275 N81-19126 #
PNR-90024 p0131 N81-14004 #
PNR-90029 p0138 N81-14793 #
PNR-90032 p0138 N81-14795 #
PNR-90034 p0130 N81-13964 #
PNR-90043 p0338 N81-21037 #
PNR-90047 p0275 N81-19127 #
PNR-90058 p0583 N81-30133 #
PNR-90068 p0602 N81-31398 #

PSAD-80-50 p0334 N81-20077
PSAD-80-50 p0488 N81-26149 #

PSR/TURBO-R81-7 p0540 N81-28097*#

PTRB-80-22 p0334 N81-20073 #

PTTR-80-16 p0194 N81-16098 #

PTR-81-7 p0376 N81-22282*#

PUA-FR-11878-PT-2 p0029 N81-10074 #
PUA-FR-11878-VOL-1 p0036 N81-11041 #
PUA-FR-13036A p0134 N81-14325 #
PUA-FR-13144 p0335 N81-20080 #
PUA-FR-13514 p0091 N81-13034 #

PWA-5512-75	p0390	N81-23086*#
PWA-5515-138	p0214	N81-17080*#
PWA-5523-92	p0078	N81-12087*#
PWA-5550-5-VOL-2-BK-3	p0214	N81-17084*#
PWA-5550-37	p0093	N81-13057*#
PWA-5550-50-VOL-1	p0214	N81-17081*#
PWA-5550-50-VOL-2-BK-1	p0214	N81-17082*#
PWA-5550-50-VOL-2-BK-2	p0214	N81-17083*#
PWA-5550-50-VOL-3-BK-1	p0214	N81-17085*#
PWA-5550-50-VOL-3-BK-2	p0214	N81-17086*#
PWA-5584-33	p0215	N81-17091 #
PWA-5594-141	p0442	N81-25077*#
PWA-5594-159	p0496	N81-27093*#
PWA-5635-43	p0147	N81-15769*#
PWA-5684-19	p0213	N81-17079*#
PWA-5697-29	p0277	N81-19316*#
PWA-5706-16	p0428	N81-24067*#
PWA-5755	p0144	N81-15006*#
P81-10097	p0492	N81-27060*
QMC/EP-1034	p0487	N81-26122 #
QMC/EP-1035	p0487	N81-26124 #
QMC/EP-1038	p0487	N81-26123 #
QPR-10	p0550	N81-29165*#
QR-11	p0023	N81-10021*#
QTPR-5	p0194	N81-16042*#
QTPR-9	p0198	N81-16139*#
QTPR-12	p0085	N81-12426 #
R-SAL-03/81-03	p0434	N81-24112*#
R-1562	p0249	N81-18028*#
R-1614	p0393	N81-23487*#
R-1627A	p0582	N81-30117 #
RAD-219-030-03	p0586	N81-30282 #
RADC-TR-80-302	p0201	N81-16357 #
RADC-TR-81-26	p0491	N81-26349 #
RADC-TR-81-116	p0640	N81-33393 #
RAE-AERO-3464	p0022	N81-10015 #
RAE-AERO-3476	p0330	N81-20040 #
RAE-AERO-3479	p0073	N81-12038 #
RAE-FS-140	p0605	N81-31588 #
RAE-RAD-NAV-VOL-1	p0026	N81-10044 #
RAE-STRUCT-BF/B/0794	p0022	N81-10016 #
RAE-TM-FS-313	p0084	N81-12320 #
RAE-TR-77184	p0021	N81-10010 #
RAE-TR-78038	p0144	N81-15009 #
RAE-TR-79029	p0082	N81-12113 #
RAE-TR-79052-VOL-1	p0026	N81-10044 #
RAE-TR-79052-VOL-2	p0026	N81-10045 #
RAE-TR-79052-VOL-3	p0026	N81-10046 #
RAE-TR-79120	p0022	N81-10015 #
RAE-TR-79125	p0022	N81-10016 #
RAE-TR-80039	p0330	N81-20040 #
RAE-TR-80060	p0073	N81-12038 #
RAE-TR-81014	p0605	N81-31588 #
RAND/R-2440-AF	p0036	N81-11042 #
RAND/R-2565-AF	p0483	N81-26035 #
RAND/R-2731-PA/E	p0631	N81-33133 #
RAND/WN-10233-NASA	p0273	N81-19111*#
RE-623-PT-1	p0637	N81-33192 #
REPT-D-19	p0031	N81-10576*#
REPT-E81-91441031	p0549	N81-29130*#
REPT-5WW/TFRE-80/001	p0446	N81-25637 #
REPT-5WW/TFRE-80/002	p0446	N81-25638 #
REPT-21-3365-A	p0029	N81-10672 #
REPT-21-3805(01)	p0583	N81-30131 #
REPT-22	p0088	N81-12824 #
REPT-25	p0035	N81-11033 #
REPT-81-17693	p0583	N81-30127 #
REPT-81APB521	p0582	N81-30120 #
REPT-149	p0379	N81-22666 #
REPT-0747-81-PT-1	p0441	N81-25060*#
REPT-1310-R-0020	p0437	N81-24360 #
REPT-2258-02-1-2439	p0629	N81-32144 #
REPT-2258-03-2-2477	p0583	N81-30128 #
REPT-4215	p0345	N81-21871*#
REPT-7430-927001	p0279	N81-19488*#
RISOE-M-2199	p0279	N81-19497 #
RMCS-80002	p0601	N81-31225 #
RR-80-8	p0344	N81-21239 #
RSG-313-72	p0037	N81-11065 #
RSG-313-80	p0037	N81-11065 #
RSRE-MEMO-3248	p0084	N81-12351 #
RTCA/DO-134	p0336	N81-20323 #
RTCA/DO-172	p0336	N81-20322 #
RTCA/DO-173	p0336	N81-20323 #
RTCA/DO-177	p0595	N81-31180 #
RTCA/DO-177	p0628	N81-32133 #
RTN-0180	p0198	N81-16072 #
RTI/1825/01-01F	p0537	N81-28070*#
R75AEG026-VOL-1	p0376	N81-22052*#
R77AEG229-VOL-1	p0497	N81-27097*#
R78AEG612	p0143	N81-15005*#
R79AEG052-VOL-2	p0020	N81-10068 #
R79AEG052-VOL-3	p0020	N81-10069 #
R79AEG123	p0214	N81-17087 #
R79AEG274	p0375	N81-22051*#
R79AEG388	p0203	N81-16850*#
R80-954440-17	p0084	N81-12255*#
R80AEG068	p0442	N81-25070*#
R80AEG312-VOL-2	p0195	N81-16051*#
R80AEG313-VOL-3	p0078	N81-12086*#
R80AEG369	p0220	N81-17846*#
R80AEG388	p0583	N81-30132 #
R80AEG429	p0143	N81-15004*#
R80AEG618	p0278	N81-19323 #
R81AEG213	p0600	N81-31218 #
R81AEG219	p0213	N81-17078*#
R81AEG257	p0442	N81-25074*#
R81AEG311	p0376	N81-22053*#
R81AEG381-VOL-1	p0496	N81-27089*#
R81AEG381-VOL-2	p0496	N81-27090*#
R81AEG381-VOL-3	p0496	N81-27091*#
R81AEG393	p0597	N81-31194*#
SAAB-TN-AE-72-PT-2	p0086	N81-12465 #
SAALC/SFQ-TR-80-1	p0092	N81-13049 #
SAC/LGME-S-110	p0548	N81-29125 #
SAE PAPER 80-1152	p0406	A81-34263*
SAE PAPER 800601	p0061	A81-15326
SAE PAPER 800602	p0061	A81-15327
SAE PAPER 800605	p0061	A81-15328
SAE PAPER 800606	p0061	A81-15329
SAE PAPER 800607	p0061	A81-15330
SAE PAPER 800608	p0061	A81-15331
SAE PAPER 800609	p0062	A81-15332
SAE PAPER 800610	p0062	A81-15333
SAE PAPER 800612	p0062	A81-15334
SAE PAPER 800614	p0062	A81-15335
SAE PAPER 800616	p0062	A81-15336
SAE PAPER 800617	p0062	A81-15337
SAE PAPER 800618	p0062	A81-15338
SAE PAPER 800621	p0062	A81-15339
SAE PAPER 800622	p0063	A81-15340
SAE PAPER 800625	p0063	A81-15341
SAE PAPER 800626	p0063	A81-15342
SAE PAPER 800627	p0063	A81-15343
SAE PAPER 800629	p0063	A81-15344
SAE PAPER 800630	p0063	A81-15345
SAE PAPER 801100	p0512	A81-41776
SAE PAPER 801101	p0513	A81-41777
SAE PAPER 801110	p0395	A81-34151
SAE PAPER 801116	p0395	A81-34152*
SAE PAPER 801117	p0395	A81-34153
SAE PAPER 801118	p0396	A81-34154*
SAE PAPER 801119	p0396	A81-34155*
SAE PAPER 801120	p0396	A81-34156*

SAE PAPER 801121	p0396	A81-34157
SAE PAPER 801122	p0396	A81-34158*
SAE PAPER 801124	p0396	A81-34159
SAE PAPER 801131	p0396	A81-34162
SAE PAPER 801132	p0396	A81-34163*
SAE PAPER 801133	p0397	A81-34164*
SAE PAPER 801134	p0397	A81-34165
SAE PAPER 801135	p0397	A81-34166*
SAE PAPER 801136	p0397	A81-34167
SAE PAPER 801137	p0397	A81-34168*
SAE PAPER 801138	p0397	A81-34169*
SAE PAPER 801140	p0397	A81-34170*
SAE PAPER 801141	p0398	A81-34171
SAE PAPER 801142	p0398	A81-34172
SAE PAPER 801144	p0398	A81-34173
SAE PAPER 801145	p0398	A81-34174
SAE PAPER 801146	p0398	A81-34175
SAE PAPER 801147	p0398	A81-34176
SAE PAPER 801148	p0406	A81-34240
SAE PAPER 801149	p0406	A81-34241
SAE PAPER 801151	p0406	A81-34242
SAE PAPER 801153	p0407	A81-34244
SAE PAPER 801154	p0398	A81-34177*
SAE PAPER 801155	p0407	A81-34245
SAE PAPER 801156	p0407	A81-34246
SAE PAPER 801158	p0399	A81-34178
SAE PAPER 801163	p0399	A81-34179
SAE PAPER 801165	p0399	A81-34180
SAE PAPER 801166	p0399	A81-34181
SAE PAPER 801167	p0399	A81-34182
SAE PAPER 801168	p0399	A81-34183
SAE PAPER 801169	p0399	A81-34184
SAE PAPER 801170	p0400	A81-34185
SAE PAPER 801173	p0400	A81-34187
SAE PAPER 801175	p0400	A81-34188*
SAE PAPER 801176	p0400	A81-34189
SAE PAPER 801177	p0400	A81-34190
SAE PAPER 801178	p0400	A81-34191*
SAE PAPER 801179	p0400	A81-34192
SAE PAPER 801180	p0400	A81-34193*
SAE PAPER 801181	p0401	A81-34194
SAE PAPER 801183	p0401	A81-34196
SAE PAPER 801185	p0401	A81-34198
SAE PAPER 801187	p0401	A81-34199
SAE PAPER 801188	p0401	A81-34200
SAE PAPER 801190	p0401	A81-34201
SAE PAPER 801192	p0401	A81-34202
SAE PAPER 801193	p0402	A81-34203
SAE PAPER 801194	p0402	A81-34204
SAE PAPER 801195	p0402	A81-34205
SAE PAPER 801196	p0402	A81-34206*
SAE PAPER 801197	p0402	A81-34207
SAE PAPER 801198	p0402	A81-34208*
SAE PAPER 801199	p0402	A81-34209
SAE PAPER 801200	p0402	A81-34210
SAE PAPER 801201	p0403	A81-34211
SAE PAPER 801203	p0403	A81-34212
SAE PAPER 801205	p0403	A81-34213
SAE PAPER 801206	p0403	A81-34214
SAE PAPER 801207	p0403	A81-34215*
SAE PAPER 801208	p0403	A81-34216
SAE PAPER 801209	p0404	A81-34217
SAE PAPER 801210	p0404	A81-34218
SAE PAPER 801211	p0404	A81-34219
SAE PAPER 801212	p0404	A81-34220
SAE PAPER 801213	p0404	A81-34221*
SAE PAPER 801214	p0404	A81-34222
SAE PAPER 801218	p0404	A81-34224
SAE PAPER 801219	p0404	A81-34225
SAE PAPER 801222	p0404	A81-34226
SAE PAPER 801224	p0405	A81-34227
SAE PAPER 801225	p0405	A81-34228
SAE PAPER 801226	p0405	A81-34229
SAE PAPER 801227	p0405	A81-34230
SAE PAPER 801228	p0405	A81-34231
SAE PAPER 801230	p0405	A81-34232
SAE PAPER 801231	p0405	A81-34233
SAE PAPER 801237	p0405	A81-34235
SAE PAPER 801238	p0406	A81-34236
SAE PAPER 801239	p0406	A81-34237
SAE PAPER 801242	p0406	A81-34238
SAE PAPER 801243	p0406	A81-34239
SAE PAPER 810560	p0518	A81-42726
SAE PAPER 810562	p0518	A81-42728*
SAE PAPER 810565	p0518	A81-42730*
SAE PAPER 810567	p0518	A81-42732
SAE PAPER 810569	p0519	A81-42734
SAE PAPER 810570	p0519	A81-42735
SAE PAPER 810571	p0519	A81-42736
SAE PAPER 810572	p0519	A81-42737
SAE PAPER 810573	p0519	A81-42738
SAE PAPER 810576	p0519	A81-42740
SAE PAPER 810577	p0519	A81-42741
SAE PAPER 810579	p0519	A81-42742
SAE PAPER 810580	p0519	A81-42743
SAE PAPER 810582	p0520	A81-42744*
SAE PAPER 810584	p0520	A81-42745
SAE PAPER 810585	p0520	A81-42746
SAE PAPER 810586	p0520	A81-42747*
SAE PAPER 810591	p0520	A81-42750
SAE PAPER 810592	p0520	A81-42751
SAE PAPER 810593	p0520	A81-42752
SAE PAPER 810596	p0520	A81-42754*
SAE PAPER 810597	p0521	A81-42755
SAE PAPER 810599	p0521	A81-42756*
SAE PAPER 810600	p0521	A81-42757
SAE PAPER 810602	p0521	A81-42759
SAE PAPER 810603	p0521	A81-42760
SAE PAPER 810604	p0521	A81-42761
SAE PAPER 810605	p0521	A81-42762
SAE PAPER 810606	p0522	A81-42763*
SAE PAPER 810608	p0522	A81-42765
SAE PAPER 810611	p0522	A81-42767*
SAE PAPER 810612	p0522	A81-42768
SAE PAPER 810613	p0522	A81-42769
SAE PAPER 810614	p0522	A81-42770*
SAE PAPER 810615	p0522	A81-42771
SAE PAPER 810617	p0523	A81-42772
SAE PAPER 810618	p0523	A81-42773
SAE PAPER 810619	p0523	A81-42774
SAE PAPER 810620	p0523	A81-42775
SAE PAPER 810622	p0523	A81-42776
SAE PAPER 810623	p0523	A81-42777*
SAE PAPER 810624	p0523	A81-42778*
SAE PAPER 810625	p0523	A81-42779*
SAE PAPER 810628	p0524	A81-42780
SAE PAPER 810629	p0524	A81-42781*
SAE PAPER 810630	p0524	A81-42782
SAE PAPER 810640	p0524	A81-42784
SAE PAPER 810642	p0524	A81-42785*
SAI-80-020-CP	p0083	N81-12192 #
SAI-80-022-CP	p0392	N81-23411*#
SAI-81-030-CP	p0602	N81-31320 #
SAM-TR-80-25	p0130	N81-13964 #
SAM-TR-80-48	p0580	N81-30102 #
SAND-80-2479C	p0193	N81-16037 #
SAND-81-1106C	p0588	N81-30615 #
SAND-81-1278C	p0638	N81-33200 #
SAPR-39	p0207	N81-17039*#
SAR-40	p0541	N81-28176*#
SASR-1	p0500	N81-27088*#
SASR-3	p0344	N81-21211*#
SAWE PAPER 1331	p0352	A81-31376
SAWE PAPER 1336	p0352	A81-31377
SAWE PAPER 1338	p0352	A81-31378
SAWE PAPER 1339	p0352	A81-31379
SAWE PAPER 1340	p0352	A81-31380
SAWE PAPER 1341	p0353	A81-31381
SAWE PAPER 1343	p0353	A81-31382
SAWE PAPER 1345	p0353	A81-31383
SAWE PAPER 1346	p0353	A81-31384
SAWE PAPER 1347	p0353	A81-31385
SAWE PAPER 1351	p0353	A81-31386
SAWE PAPER 1365	p0353	A81-31387
SAWE PAPER 1366	p0353	A81-31388
SAWE PAPER 1367	p0353	A81-31389
SAWE PAPER 1383	p0353	A81-31390
SAWE PAPER 1384	p0354	A81-31400
SAWE PAPER 1385	p0354	A81-31401
SAWE PAPER 1386	p0354	A81-31402
SC595.44CSA	p0257	N81-1841[illegible] #
SC595.65IR	p0258	N81-18420 #
SD-TR-80-65	p0030	N81-11114 #
SDL-80-2122-13F	p0143	N81-15003*#
SER-13452	p0540	N81-28120 #
SER-69065	p0530	N81-28007 #
SER-70471	p0444	N81-25090*#

SERI/TR-98003-2	p0043	N81-11492 #
SNIAS-792-422-103	p0023	N81-10025 #
SNIAS-801-551-101	p0074	N81-12052 #
SNIAS-801-551-105	p0031	N81-10160
SNIAS-801-551-107	p0144	N81-15072 #
SNIAS-802-111-102	p0434	N81-24110 #
SNIAS-802-111-107	p0437	N81-24482 #
SNIAS-802-111-108	p0427	N81-24054 #
SNIAS-802-111-111	p0427	N81-24055 #
SNIAS-802-111-112	p0427	N81-24056 #
SNIAS-802-111-113	p0427	N81-24057 #
SNIAS-802-111-114	p0428	N81-24061 #
SNIAS-802-111-115	p0428	N81-24062 #
SP-5317	p0092	N81-13044*#
SRBI-R-4828-16	p0429	N81-24068*#
SRC-TR-81-1170	p0638	N81-33200 #
SRC-80-TR-57-PT-6	p0257	N81-18394 #
SRL-9799	p0131	N81-14061 #
STI-TR-1081-1-PT-1	p0581	N81-30113 #
STI-TR-1081-1-PT-2	p0581	N81-30114 #
STI-TR-1081-1-PT-3	p0581	N81-30115 #
STI-TR-1135-1	p0498	N81-27117 #
SU-JIAA-TR-30	p0483	N81-26072*#
SWRI-RED118	p0542	N81-28277 #
SWRI-02-4860	p0446	N81-25766*#
TASC-TR-1356-1	p0253	N81-18062 #
TASC-TR-3077-2-VOL-1	p0192	N81-16030 #
TASC-TR-3077-2-VOL-2	p0192	N81-16031 #
TASC-TR-3077-2-VOL-4	p0192	N81-16032 #
TCAE-1701	p0215	N81-17092 #
TCRL-17	p0335	N81-20079*#
TFD-81-01	p0249	N81-18029*#
TI-683	p0035	N81-11036 #
TN-76	p0141	N81-14989*#
TOP-6-3-013	p0334	N81-20075 #
TOP-6-3-025	p0201	N81-16375 #
TOP-6-3-205	p0387	N81-23062 #
TOP-6-3-223	p0392	N81-23358 #
TR-2-53020/IR-52726	p0483	N81-26075*#
TR-80-4102-PT-1	p0539	N81-28089 #
TR-0080(5950-01)-1	p0038	N81-11118 #
TR-1127-1-VOL-2	p0081	N81-12110*#
TR-1137-1	p0498	N81-27113*#
TR-7927	p0204	N81-16597 #
TRANS-15028	p0335	N81-20081 #
TRANS-15068	p0275	N81-19126 #
TRANS-15261	p0583	N81-30133 #
TRANS-15292	p0275	N81-19127 #
TRB/TRR-752	p0132	N81-14182 #
TRB/TRR-768	p0493	N81-27068 #
TRB/TRR-787	p0637	N81-33188 #
TRW-ER-8019-F	p0597	N81-31193*#
TRW-30323-6003-TU-00	p0543	N81-28787 #
TRW-30323-6007-TU-00	p0543	N81-28786 #
TRW-30323-6012-TU-00	p0543	N81-28785 #
TRW-30323-6015-TU-00	p0543	N81-28788 #
TRW-30323-6019-TU-00	p0543	N81-28789 #
TRW-32399-6002-UT-00	p0021	N81-10008 #
TSC-FAA-80-15-VOL-1	p0640	N81-33390 #
TSC-FAA-80-16	p0091	N81-13038 #
TSC-FAA-80-25	p0273	N81-19114 #
TSC-FAA-81-1	p0389	N81-23081 #
TSC-FAA-81-13	p0641	N81-33548 #
TT-677	p0132	N81-14195 #
TT-8002	p0541	N81-28786 #
TURS/SPE-58-80-05-01	p0628	N81-32131 #
UCLA-ENG-8037	p0631	N81-32156*#
UCRL-15257	p0085	N81-12427 #
UDR-TR-80-59	p0204	N81-16995 #
UDR-TR-80-61-PT-2	p0638	N81-33197 #
UDR-TR-80-69	p0424	N81-24036 #
UDR-TR-80-73-VOL-1	p0374	N81-22044 #
UDR-TR-80-73-VOL-2	p0375	N81-22045 #
UDR-TR-80-91-PT-1	p0638	N81-33196 #
UMICH-010209-3-F	p0548	N81-29122 #
UMTA-NY-06-0005-80-1	p0641	N81-34109 #
US-PATENT-APPL-SN-006952	p0132	N81-14077*
US-PATENT-APPL-SN-008210	p0485	N81-26114*
US-PATENT-APPL-SN-015995	p0490	N81-26152*
US-PATENT-APPL-SN-015996	p0433	N81-24106*
US-PATENT-APPL-SN-019541	p0139	N81-14968*
US-PATENT-APPL-SN-034104	p0275	N81-19130*
US-PATENT-APPL-SN-038980	p0143	N81-14999*
US-PATENT-APPL-SN-103836	p0437	N81-24443*
US-PATENT-APPL-SN-164617	p0210	N81-17057*
US-PATENT-APPL-SN-208093	p0639	N81-33210*#
US-PATENT-APPL-SN-210491	p0261	N81-19016*#
US-PATENT-APPL-SN-224231	p0202	N81-16677*#
US-PATENT-APPL-SN-234244	p0278	N81-19439*#
US-PATENT-APPL-SN-238808	p0378	N81-22358*#
US-PATENT-APPL-SN-241154	p0373	N81-22036*#
US-PATENT-APPL-SN-242790	p0375	N81-22048*#
US-PATENT-APPL-SN-243685	p0496	N81-27096*#
US-PATENT-APPL-SN-248744	p0426	N81-24047*#
US-PATENT-APPL-SN-259209	p0546	N81-29107*#
US-PATENT-APPL-SN-263829	p0628	N81-32138*#
US-PATENT-APPL-SN-267935	p0550	N81-29138*#
US-PATENT-APPL-SN-274705	p0601	N81-31230*#
US-PATENT-APPL-SN-274706	p0601	N81-31229*#
US-PATENT-APPL-SN-568541	p0132	N81-14077*
US-PATENT-APPL-SN-727503	p0275	N81-19130*
US-PATENT-APPL-SN-741056	p0274	N81-19116*
US-PATENT-APPL-SN-752050	p0273	N81-19115*
US-PATENT-APPL-SN-785279	p0132	N81-14077*
US-PATENT-APPL-SN-862878	p0138	N81-14967*
US-PATENT-APPL-SN-893865	p0437	N81-24443*
US-PATENT-APPL-SN-907421	p0133	N81-14318*
US-PATENT-APPL-SN-909235	p0273	N81-19115*
US-PATENT-APPL-SN-909608	p0274	N81-19116*
US-PATENT-APPL-SN-916654	p0549	N81-29129*
US-PATENT-APPL-SN-969755	p0270	N81-19087*
US-PATENT-CLASS-60-39.06	p0549	N81-29129*
US-PATENT-CLASS-60-39.24	p0273	N81-19115*
US-PATENT-CLASS-60-226R	p0274	N81-19116*
US-PATENT-CLASS-60-236	p0274	N81-19116*
US-PATENT-CLASS-60-238	p0274	N81-19116*
US-PATENT-CLASS-60-239	p0274	N81-19116*
US-PATENT-CLASS-60-259	p0485	N81-26114*
US-PATENT-CLASS-60-267	p0485	N81-26114*
US-PATENT-CLASS-60-518	p0133	N81-14318*
US-PATENT-CLASS-60-726	p0549	N81-29129*
US-PATENT-CLASS-60-730	p0485	N81-26114*
US-PATENT-CLASS-60-737	p0549	N81-29129*
US-PATENT-CLASS-62-DIG.5	p0485	N81-26114*
US-PATENT-CLASS-68-3R	p0138	N81-14967*
US-PATENT-CLASS-73-147	p0210	N81-17057*
US-PATENT-CLASS-73-178R	p0210	N81-17057*
US-PATENT-CLASS-74-417	p0133	N81-14318*
US-PATENT-CLASS-74-519	p0270	N81-19087*
US-PATENT-CLASS-102-56R	p0139	N81-14968*
US-PATENT-CLASS-102-92.1	p0139	N81-14968*
US-PATENT-CLASS-137-15.1	p0143	N81-14999*
US-PATENT-CLASS-152-330RF	p0437	N81-24443*
US-PATENT-CLASS-152-353G	p0437	N81-24443*
US-PATENT-CLASS-152-353R	p0437	N81-24443*
US-PATENT-CLASS-152-379.4	p0437	N81-24443*
US-PATENT-CLASS-156-154	p0132	N81-14077*
US-PATENT-CLASS-156-160	p0132	N81-14077*
US-PATENT-CLASS-156-163	p0132	N81-14077*
US-PATENT-CLASS-156-212	p0132	N81-14077*
US-PATENT-CLASS-156-267	p0132	N81-14077*
US-PATENT-CLASS-156-295	p0132	N81-14077*
US-PATENT-CLASS-156-323	p0132	N81-14077*
US-PATENT-CLASS-156-331	p0132	N81-14077*
US-PATENT-CLASS-165-104.14	p0485	N81-26114*

US-PATENT-CLASS-181-214 .... p0143 N81-14999*
US-PATENT-CLASS-244-12.5 .... p0275 N81-19130*
US-PATENT-CLASS-244-17.25 .... p0270 N81-19087*
US-PATENT-CLASS-244-52 .... p0275 N81-19130*
US-PATENT-CLASS-244-87 .... p0275 N81-19130*
US-PATENT-CLASS-244-103R p0437 N81-24443*
US-PATENT-CLASS-244-117A p0485 N81-26114*
US-PATENT-CLASS-244-119 .... p0139 N81-14568*
US-PATENT-CLASS-244-130 .... p0139 N81-14568*
US-PATENT-CLASS-244-130 .... p0437 N81-24443*
US-PATENT-CLASS-244-163 .... p0485 N81-26114*
US-PATENT-CLASS-244-181 .... p0433 N81-24106*
US-PATENT-CLASS-244-181 .... p0490 N81-26152*
US-PATENT-CLASS-244-182 .... p0490 N81-26152*
US-PATENT-CLASS-244-155 .... p0433 N81-24106*
US-PATENT-CLASS-261-28 .... p0549 N81-29129*
US-PATENT-CLASS-318-584 .... p0433 N81-24106*
US-PATENT-CLASS-364-166 .... p0273 N81-19115*
US-PATENT-CLASS-364-431 .... p0273 N81-19115*
US-PATENT-CLASS-364-434 .... p0433 N81-24106*
US-PATENT-CLASS-416-114 .... p0270 N81-19087*
US-PATENT-CLASS-416-500 .... p0270 N81-19087*
US-PATENT-CLASS-431-2 .... p0549 N81-29129*

US-PATENT-4,032,089 .... p0132 N81-14077*
US-PATENT-4,189,914 .... p0549 N81-29129*
US-PATENT-4,220,171 .... p0143 N81-14999*
US-PATENT-4,224,810 .... p0138 N81-14567*
US-PATENT-4,225,102 .... p0139 N81-14568*
US-PATENT-4,225,372 .... p0132 N81-14077*
US-PATENT-4,228,656 .... p0133 N81-14318*
US-PATENT-4,236,684 .... p0275 N81-19130*
US-PATENT-4,240,290 .... p0210 N81-17057*
US-PATENT-4,242,864 .... p0274 N81-19116*
US-PATENT-4,245,956 .... p0270 N81-19087*
US-PATENT-4,249,238 .... p0273 N81-19115*
US-PATENT-4,261,537 .... p0433 N81-24106*
US-PATENT-4,266,743 .... p0490 N81-26152*
US-PATENT-4,267,992 .... p0437 N81-24443*
US-PATENT-4,273,304 .... p0485 N81-26114*

USAAEFA-77-25 .... p0027 N81-10061 #
USAAEFA-78-09 .... p0252 N81-18052 #
USAAEFA-79-02 .... p0340 N81-21062 #
USAAEFA-79-03 .... p0582 N81-30119 #
USAAEFA-79-06 .... p0194 N81-16046 #
USAAEFA-79-08 .... p0548 N81-29121 #
USAAEFA-79-09 .... p0194 N81-16045 #
USAAEFA-79-19 .... p0340 N81-21063 #

USAARL-81-3 .... p0442 N81-25071 #

USAAVRADCOM-TR-79-F-0282 .... p0251 N81-18042 #
USAAVRADCOM-TR-80-D-10 .... p0343 N81-21085 #
USAAVRADCOM-TR-80-D-15 .... p0393 N81-23438 #
USAAVRADCOM-TR-80-D-19 .... p0076 N81-12075 #
USAAVRADCOM-TR-80-D-20 .... p0035 N81-11034 #
USAAVRADCOM-TR-80-D-21 .... p0439 N81-25043 #
USAAVRADCOM-TR-80-D-22 .... p0252 N81-18049 #
USAAVRADCOM-TR-80-D-25 .... p0092 N81-13047 #
USAAVRADCOM-TR-80-D-28 .... p0272 N81-19106 #
USAAVRADCOM-TR-80-D-31 .... p0374 N81-22041 #
USAAVRADCOM-TR-80-E-2 .... p0075 N81-12058 #
USAAVRADCOM-TR-80-F-9 .... p0134 N81-14324 #
USAAVRADCOM-TR-81-A-7 .... p0272 N81-19101*#
USAAVRADCOM-TR-81-B-1 .... p0338 N81-21027*#
USAAVRADCOM-TR-81-D-5 .... p0538 N81-28087 #
USAAVRADCOM-TR-81-D-6 .... p0427 N81-24060 #
USAAVRADCOM-TR-81-D-8 .... p0438 N81-24862 #
USAAVRADCOM-TR-81-D-9A .... p0434 N81-24108 #
USAAVRADCOM-TR-81-D-10 .... p0582 N81-30117 #
USAAVRADCOM-TR-81-F-3 .... p0344 N81-21239 #

USAAVRADCOM-80-0006-F .... p0640 N81-33240 #

USAFA-TR-81-1 .... p0263 N81-19029 #

USAFA-TR-80-17 .... p0263 N81-19029 #
USAFA-TR-81-3 .... p0373 N81-22034 #

USARTL-TR-79-22A .... p0204 N81-16997 #

UTEC-CSC-81-020 .... p0551 N81-29323 #

UTIAS-REVIEW-44 .... p0033 N81-11620 #

UTIAS-TN-228 .... p0552 N81-29324 #

UTIAS-246 .... p0144 N81-15154 #

UTIAS-248 .... p0146 N81-15888 #

UTRC/R81-914986-5 .... p0435 N81-25046 #

UTSI-81-1 .... p0637 N81-33195 #

UVA/528166/EAS81/101 .... p0594 N81-31189*#

VITRO/JOB-03021-03540 .... p0128 N81-13949 #

VKI-LS-1980-5-VOL-2 .... p0144 N81-15310 #

VKI-PREPRINT-1979-15 .... p0085 N81-12453 #
VKI-PREPRINT-1979-16 .... p0031 N81-10437 #
VKI-PREPRINT-1980-10 .... p0021 N81-10011 #

VTH-LR-276 .... p0542 N81-28409 #
VTH-LR-292 .... p0128 N81-13951 #
VTH-LR-302 .... p0540 N81-28100 #
VTH-LR-305 .... p0537 N81-28065 #

VTH-M-392 .... p0542 N81-28403 #

WR-78-11-VOL-1 .... p0087 N81-12644 #
WR-78-11-VOL-2 .... p0087 N81-12645 #
WR-79-9-VOL-3 .... p0096 N81-13719 #
WR-79-9-VOL-5 .... p0096 N81-13720 #
WR-80-32 .... p0491 N81-26846*#

WRC-79-106-39 .... p0600 N81-31220 #

WRC0129-TR-81-1 .... p0429 N81-24069 #

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AERONAUTICAL ENGINEERING

A Continuing Bibliography

Abstracts
January - December 1981

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AERONAUTICAL ENGINEERING

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 145)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in January 1982 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

Scientific and Technical Information Branch 1982
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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 326 reports, journal articles, and other documents originally announced in January 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

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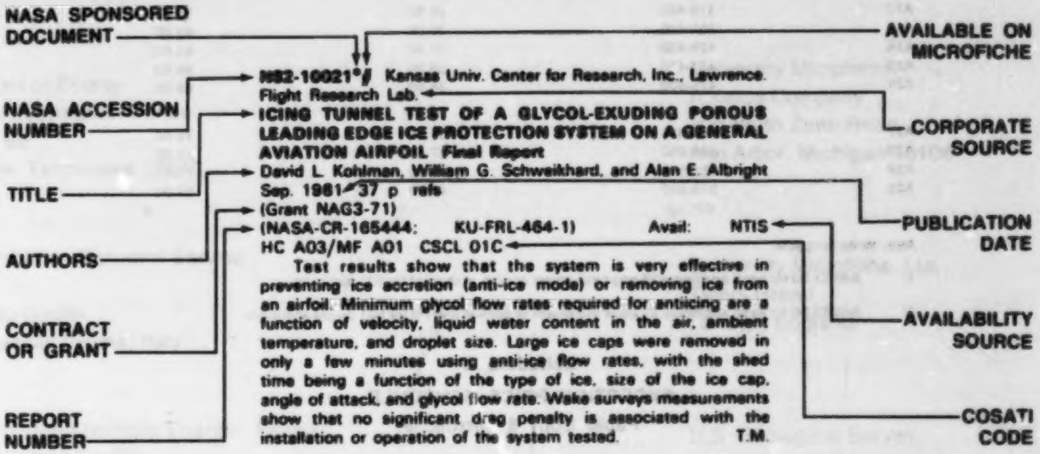

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.

ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report

David L. Kohlman, William G. Schweikhard, and Alan E. Albright Sep. 1981 37 p refs

(Grant NAG3-71)

(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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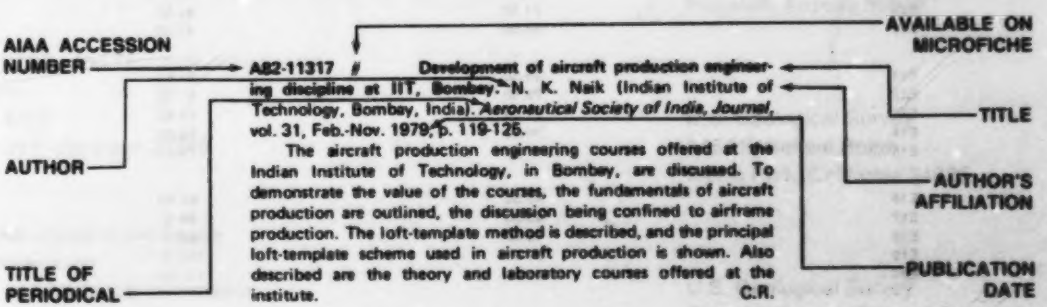

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 145)

FEBRUARY 1982

IAA ENTRIES

A82-10049 **Three navigation systems and their costs of acquiring remote sensing data.** D. L. Hawley (EG & G, Inc., Las Vegas, NV). In: American Society of Photogrammetry, Annual Meeting, 46th, St. Louis, MO, March 9-14, 1980, ASP Technical Papers. Falls Church, VA, American Society of Photogrammetry, 1980, p. 426-431.

Three types of navigational systems have been analyzed and evaluated as to their capabilities for data acquisition. Two basic systems, visual navigation and strobe-aided navigation, are useful for daylight photographic flights. One additional system, more technical, is the microwave ranging system, crucial to the acquisition of multiple nighttime scanner data flights. These systems have been analyzed as to their capabilities and costs. A table of mission requirements and navigation techniques is presented. These types of studies are not unique, however in this paper, the information is presented in a comparison unique to the equipment involved. This comparison is presented relating the cost of the navigation systems and the costs of their use. The result is a time and dollar comparison of these navigation systems. (Author)

A82-10061 # **KC-135 Avionics Modernization Hot Bench.** J. L. Archdeacon and C. E. Wilent (TRW Defense and Space Systems Group, Dayton, OH). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 32-40. 10 refs. Contract No. F33600-80-C-0173. (AIAA 81-2106)

The U.S. Air Force has embarked upon an avionics update program for the KC-135 Stratotanker fleet. An overview is provided of the KC-135 Avionics Modernization Hot Bench (AMHB). The objective of the AMHB is to support conceptual definition of a representative KC-135 modernized avionics system. The KC-135 AMHB consists of the Modernization Avionics Suite (MAS), Environmental Systems Simulation (ESS), and the Hot Bench Monitor (HBM). Attention is given to actual avionics hardware, simulated avionic subsystems, avionic application tasks, system control, cockpit device management, guidance and performance management, flight plan management, backup control, and hot bench performance monitoring. The navigation system is also considered. TACAN, Doppler, and Digital Scan Converter data are preprocessed and compared with INS data. G.R.

A82-10062 * # **HiMAT onboard flight computer system architecture and qualification.** A. F. Myers, M. R. Earls (NASA, Flight Research Center, Edwards, CA), and L. A. Calizo (Rockwell International Corp., Los Angeles, CA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 41-54. (AIAA 81-2107)

Two highly maneuverable aircraft technology (HiMAT) remotely piloted research vehicles (RPRV's) are being flight tested at NASA Dryden Flight Research Center, Edwards, California, to demonstrate and evaluate a number of technological advances applicable to future fighter aircraft. Closed-loop primary flight control is performed from a ground-based cockpit utilizing a digital computer and up/down telemetry links. A backup flight control system for emergency operation resides in one of two onboard computers. Other functions of the onboard computer system are uplink processing, downlink processing, engine control, failure detection, and redundancy management. This paper describes the architecture, functions, and flight qualification of the HiMAT onboard flight computer systems. (Author)

A82-10063 # **Synchronous fault-tolerant flight control systems.** T. B. Smith (Charles Stark Draper Laboratory, Inc., Cambridge, MA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 55-60. 5 refs. (AIAA 81-2109)

Synchronous fault-tolerant systems have some unique advantages over asynchronous systems, particularly as the flight control task becomes more complex. One of the advantages is related to channel fault-detection. Asynchronous systems must rely upon setting fault thresholds for detecting computational failure within a channel. The design of the threshold can be a difficult problem. There is a rule that a fault must be present for a number of frames to be significant. These problems are largely avoided with synchronous systems, outputs are identical, and a single test of exact agreement is a perfect test. Noisy and skew effects which plague asynchronous fault detection have no effect. Other advantages of synchronous fault-tolerant systems are related to sensor fault-detection and multimode operation. Attention is given to the reasons for the present preponderance of asynchronous designs, and the use of tightly synchronized processing. G.R.

A82-10066 # **Integration of computer graphics design with analytical models.** R. J. Ricci (Lockheed-California Co., Burbank, CA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 144-149. (AIAA 81-2134)

The development of Computer-Augmented Design and Manufacturing (CADAM), an interactive computer graphics system is discussed. The system is used throughout the design process from conceptual design through product support. In the conceptual design phase, basic three-view general arrangement drawings are developed. These can be quickly and accurately converted into a three-dimensional mathematical surface definition. From this information, analysis data models are generated semi-automatically for input to batch computing programs. Major areas where analysis modelers have been developed include: parametric mission analysis, aerodynamic drag modelers, structural finite element modelers, 1 g load and mass distribution modelers, fuel tank and volume analyzers, and weight and balance modelers. (Author)

A82-10069 # **The Space Shuttle vehicle checkout involving flight avionics software.** J. T. B. Mayer (Intermetrics, Inc., Cambridge, MA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 173-178. (AIAA 81-2141)

A description is presented of the process employed in generating a vehicle test using the flight avionics software. The three types of onboard software available to the verification engineer include flight avionics software, vehicle utility software, and dynamic integrated test software. In most cases the flight software was modified to perform the desired functions in a manner desired by the test

engineer. Attention is given to vehicle test development, test verification, vehicle test execution, and vehicle test considerations. The reported investigation shows that it should be possible in future systems to control the cost of verification and checkout by designing the verification process in conjunction with the operational software. There are operational tradeoffs that can greatly reduce the costs of verification, which in the long run can reduce the total program cost.
G.R.

A82-10101 # **Bridging the gap from aircraft to space computers.** P. Mitchell and C. Vlcek (Itek Corp., Applied Technology Div., Sunnyvale, CA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 179-186. 7 refs. (AIAA 81-2142)

This paper investigates the design problems associated with avionics and space computers, and identifies those which are common to both, versus those which are unique to a specific application. Based on historical developments and predictions of future needs, a plan is presented which resolves many of these problems and supports real-time technology insertion in a low cost, rapid deployment approach. A computer development program is described which utilizes a modular family of functional elements, allowing a wide variety of space and aircraft requirements to be met using common hardware. Continuing development activities have expanded this system architecture into a highly fault tolerant and flexible family of computers with incremental design steps depending heavily on existing qualified hardware and software elements.
(Author)

A82-10104 # **Airborne associative processor /ASPRO/.** T. DiGiacinto (Goodyear Aerospace Corp., Digital Technology Dept., Akron, OH). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 202-205. (AIAA 81-2145)

The ASPRO associative processor is designed for an airborne early warning radar surveillance, command and control application. It augments the existing data processors aboard a surveillance aircraft. The functional requirements of ASPRO call for extraordinary processing capacity for its volume, weight and power constraints (less than 1/2 cubic foot). ASPRO development was made feasible by designing the architecture to make use of available LSI components for arithmetic operations, addressing, program and interrupt control. The memory and parallel processing sections of ASPRO required development of two special components, a multichip memory package, and a custom 32-PE chip for the parallel processor.
(Author)

A82-10116 # **Controlling the software/hardware interface for the validation of avionics systems.** T. G. Lahn and E. R. Rang (Honeywell, Inc., Minneapolis, MN). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 283-287. (AIAA 81-2159)

A methodology is outlined for designing critical embedded avionics by exposing the hardware/software interface during the design and validation of the system. The proposed approach involves the development of a finite-state machine representation for the control of flow of the system's functions and implementation of the finite-state machine by hardware and software. This produces a complete structure that is easy to review and validate. The approach is demonstrated for a triply-redundant flight augmentation system.
V.L.

A82-10120 # **Automated Paint and Process Line /APPL/.** N. E. Manion (Lockheed-Georgia Co., Marietta, GA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 319, 321, 323 (3 ff.). (AIAA 81-2166)

In an effort to control costs, the military and industry are pursuing ways to improve production efficiency by increasing the degree of automation of factory operated chemical processing and painting facilities used in the fabrication of aircraft parts. These parts, and especially those of major weapon systems, are not, however, easily amenable to automation. Critical operations are automated by a five-level control hierarchy developed for a new Automated Paint and Process Line with advanced software which provides operating flexibility. A variety of part sizes and shapes are transformed into uniform handling units by special part holders. The chemical processing computer is programmed to handle ten loads of work simultaneously. A painting robot is programmed by painting a selected target with a spray gun attached to the arm of the manipulator with the robot in a 'teach' mode. Systems will be added later to automatically track shop orders and control chemical solutions.
J.F.

A82-10125 # **Use of Space Shuttle technology in conventional aircraft.** W. A. Ragsdale (Intermetrics, Inc., Houston, TX). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 358-361. 7 refs. (AIAA 81-2176)

A number of advances in the state-of-the-art for aircraft systems and procedures have been implemented in the Space Shuttle. Much of the new technology used would benefit conventional aircraft, especially airliners. Automatic systems management as employed for the Shuttle would simplify the task of flying an airliner. The pilot is given by the computer only the information he needs to know. The area navigation (RNAV) system used by the Space Shuttle is three-dimensional RNAV. It steers the Space Shuttle not only to a latitude and longitude, but to a specific altitude. The use of a four-dimensional RNAV, including also the monitoring of time, would provide additional advantages. A use of RNAV systems in aircraft makes possible savings in the consumption of fuel and leads to simplifications in air traffic control. Further reduction in fuel consumption can be obtained with the aid of energy management approaches. Additional advantages for aircraft operations can be obtained by the employment of the Microwave Landing System and digital fly-by-wire flight controls.
G.R.

A82-10126 # **A microprocessor-based data acquisition system for stall/spin research.** M. Sri-Jayantha and R. F. Stengel (Princeton University, Princeton, NJ). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 362-372. 25 refs. Research supported by the Shultz Foundation. (AIAA 81-2177)

Accurate data are necessary for the identification of aerodynamic parameters at high angle of attack and in spinning flight. Modern sensors and microelectronic devices are employed in a stall/spin data acquisition system that will be tested in a Schweizer 2-32 sailplane. This instrumentation package will use a quaternion-based 'strapdown IMU' algorithm to derive vehicle attitude from angular rate data, and it will use fault-detection logic to identify in-flight sensor failures. Details of the system and flight test program are presented, together with results of pre-flight digital simulation analysis.
(Author)

A82-10127 # **Real-time, on-line digital simulation of optimum maneuvers of supersonic aircraft.** C.-F. Lin (Applied Dynamics International, Ann Arbor, MI). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 373-381. (AIAA 81-2178)

This paper discusses real-time simulation of automatic guidance and control computer system of a supersonic fighter including a complete simulation of the mission computer and the flight control computer before connecting them as hardware in the loop. In this simulation the mission computer generates real-time, on-line optimal trajectories. These trajectories include maximum range glide and minimum time zoom climb. They are then tracked by the flight control computer. For this kind of simulation it is essential that the computational speed be very fast, thus a very fast computer with real-time, on-line capabilities is used for the simulation. Results of the simulation show that the mission computer is capable of generating online optimal trajectories much faster than real time, and that the flight control computer is capable of following very closely these trajectories at the same speed. (Author)

A82-10140 # **Performance analysis of enroute air traffic control computers in the National Airspace System.** J. Press (FAA, Systems Research and Development Service, Atlantic City, NJ). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 485-495. 12 refs. (AIAA 81-2203)

This paper describes a computer performance analysis recently completed at the Federal Aviation Administration Technical Center for all twenty enroute air traffic control centers in the National Airspace System. Based on linear regression, the analysis relied on field data collected nationwide in order to quantify the performance of the central computer complex operating at each facility. The data was recorded every minute for several days while the computers were supporting air traffic control operations. Graphs and tables summarize the study's results which will serve as a basis for management plans concerning future system acquisition. As a major conclusion, the methodology developed in this study applies consistently to all enroute traffic control centers. (Author)

A82-10143 # **Interoperability testing of decentralized command, control, communications and intelligence /C3I/ systems.** E. G. Ries (System Development Corp., McLean, VA) and R. C. Bjorklund (USAF, Tactical Air Command, Langley AFB, VA). In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 513-520. 8 refs. (AIAA 81-2205)

The testing of complex, real-time C3I systems by conventional methods requires considerable resources, time, and realistic operational conditions. The decentralization of systems among diverse locations imposes further demands. Tactical Air Command is developing the Simulation, Monitoring, and Analysis, Reduction, and Test System (SMARTS) to provide a controlled test environment for C3I systems, a design incorporating an operations-scenario generator for efficient test design and analysis. SMARTS is a flexible test platform for Air Force and Joint interoperability testing, configuration management, system testing, and software maintenance. The design of SMARTS provides intercommunications between geographically separated test nodes, test control, recording, analysis, and simulation of radar and data communications for a synchronized test environment. (Author)

A82-10214 * **Downbursts and microbursts - An aviation hazard.** T. T. Fujita (Chicago, University, Chicago, IL). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 94-101. 12 refs. NSF Grant No. ATM-78-01074; Grants No. NOAA-04-4-158-1; No. NGR-14-001-008.

Downburst and microburst phenomena occurring since 1975 are studied, based on meteorological analyses of aircraft accidents, aerial surveys of wind effects left behind downbursts, and studies of sub-mesoscale wind systems. It is concluded that microbursts beneath small, air mass thunderstorms are unpredictable in terms of weather forecast. Most aircraft incidents, however, were found to have occurred in the summer months, June through August. An intense microburst could produce 150 mph horizontal winds as well as 60 fps downflows at the tree-top level. The largest contributing factor to aircraft difficulties seemed to be a combination of the headwind decrease and the downflow. Anemometers and/or pressure sensors placed near runways were found effective for detecting gust fronts, but not for detecting downbursts. It is recommended that new detection systems placed on the ground or airborne, be developed, and that pilots be trained for simulated landing and go-around through microbursts. J.F.

A82-10215 **Applications of conventional and Doppler radars for aviation safety.** J. T. Lee and K. E. Wilk (NOAA, National Severe Storms Laboratory, Norman, OK). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 102-109. 24 refs.

Past and present efforts at the National Severe Storms Laboratory to help provide improved operational procedures for aviation support are summarized. Quantitative data presentation and information assimilation now have greater importance, since Doppler radar is evolving toward operational use by weather services. Wind shear, vortices, and turbulence, which constitute weather hazards to aviation, must be identified and measured, and effective ways to disseminate information on the location, intensity, and movement of these hazards to the forecaster and pilot must be found. Despite the progress made thus far, research is still required to better validate radar signatures which identify storm hazards uniquely; even greater advances are needed in the design of displays and types of data parameterizations which will present significant information efficiently to the interpreter. It is suggested that user requirements be included in the designs of future radar systems at an early stage to reduce irrelevant information which complicates displays. J.F.

A82-10217 **Description of the meteorological research radar system aboard NOAA/Research Facilities Center WP-3D aircraft.** J. D. DuGranrut (NOAA, Environmental Research Laboratories, Miami, FL). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints.
Boston, MA, American Meteorological Society, 1980, p. 116-117.

The radar system developed for the Research Facilities Center's WP-3D airborne research platform provides data from three radar sets recorded on computer-compatible media: the nose radar scans horizontally over the range + or - 120 deg from the aircraft, heading at tilt angles of + or - 20 deg from the horizon. It operates at C-band frequency (5445 MHz) and has a processed range of 100 nautical miles. The lower fuselage radar scans a full 360 deg horizontally at tilt angles of + or - 10 deg from the horizon; it also operates at C-band frequency (5370 MHz) and has a processed range of 200 nautical miles. The tail radar scans a plane perpendicular to the longitude axis of the aircraft; it operates at X-band frequency (9315 MHz) and has a processed range of 50 nautical miles. The data processing equipment of the radar data system is controlled by video integrator processors, scan converter display units, and magnetic tape units. The radars may be operated without the data system for display of weather avoidance and navigation information when data processing and recording are not required. A more detailed description is given of the receiver/transmitters, the antennas and antenna control units, the video integrator processors, the recording system, and the real-time display system. J.F.

A82-10219 **Airborne weather radar and severe weather penetration.** J. I. Metcalf (Georgia Institute of Technology, Atlanta, GA). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 126-129. 6 refs.

The effect of rain on airborne weather radar performance and its practical implications are examined. It is shown that whenever the actual reflectivity is greater than 45 dBZ (rainfall rate in excess of 25 mm/hr), significant attenuation (greater than 0.5 dB/km one way) can be expected, leading to major distortions of the reflectivity pattern observed with a 3-cm radar. Examples discussed illustrate the need for aircrews to obtain additional weather information including data from ground-based weather radars at any time when the on-board radar shows weather echoes near the projected flight path, particularly when weather penetration is contemplated. V.L.

A82-10220 * **An airport wind shear detection and warning system using Doppler radar.** J. McCarthy (National Center for Atmospheric Research, Boulder, CO), W. Frost, B. Turkel (Tennessee, University, Tullahoma, TN), R. J. Doviak (NOAA, National Severe Storms Laboratory, Norman, OK), D. W. Camp (NASA, Marshall Space Flight Center, Huntsville, AL), E. F. Blick, and K. L. Elmore (Oklahoma, University, Norman, OK). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 135-142. 7 refs. NSF Grants No. ATM-74-03408-A02; No. ATM-78-12401; Contracts No. NAS8-31377; No. NAS8-33458.

Two numerical models of aircraft performance are developed to relate atmospheric wind signals in wind-shear situations to aircraft response. Both models produce time histories of pitch angle, airspeed, height above the ground, and other parameters for simulating aircraft making precision approaches along a 3-deg glide slope to the runway. Simulations conducted using thunderstorm environment wind data indicate that the horizontal wind component is at least as important as the vertical component in determining aircraft response to wind shear. Obtaining quantitative measurements of aircraft approach or departure quality is found to depend on several factors, including the knowledge of winds along the expected flight track, clear-air detection in a quasi-horizontal path, and a near continuous estimate of approach deterioration due to shear conditions. D.L.G.

A82-10221 * **Instrumented aircraft verification of clear-air radar detection of low-level wind shear.** J. McCarthy (National Center for Atmospheric Research, Boulder, CO), K. L. Elmore (Oklahoma, University, Norman, OK), R. J. Doviak, and D. S. Zrnic (NOAA, Severe Storms Laboratory, Norman, OK). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 143-149. NSF Grants No. ATM-74-03406-A02; No. ATM-78-12401; Contracts No. NAS8-31377; No. NAS8-33458.

A technique is described in which the longitudinal wind component at airports, measured by Doppler radar, is put through a Fourier transformation to produce an energy density spectrum. The result is multiplied by the aircraft response characteristics to produce quantitative data on aircraft performance in a wind shear situation. The Doppler radar measurements are made along the intended flight path. Two case studies, along a 3 deg approach path, are described from measurements in two modes: Lagrangian, where predictions were computed one range gate ahead of the plane, and Eulerian, where samples were measured instantaneously along the flight path. Wind data obtained every second were interpolated to fit a numerical model by using a cubic spline. Eulerian data were superior to Lagrangian data in terms of ranging, and nearly equal for wind speeds. Improvements in current 75% accuracy are noted to be possible with shrouded antennas to reduce sidelobes and use of Doppler radar with higher resolution to eliminate effects of small scale disturbances within the pulse volume. M.S.K.

A82-10222 **Detection and display of wind shear and turbulence.** J. Wilson, R. Carbone, and R. Serafin (National Center for Atmospheric Research, Boulder, CO). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 150-156. 9 refs.

Displays of wind shear are given which are obtained by a method for certain cases collected by NCAR 5 cm wavelength radars. A Doppler radar located at an airport or in an aircraft measures the wind shear along flight paths on scales critical to aircraft operations. The magnitude of the shear on the desired scale is then obtained by measuring the wind shear over a distance of one-half the aircraft phugoid wavelength. Four cases classified as severe storms show that significant wind changes occur within 0.5 to 3.0 km, which includes the phugoid wavelength of modern aircraft. It is suggested that a practical solution for the detection of hazardous wind shear is to locate a scanning Doppler at an airport so that quantitative displays of wind changes at the phugoid wavelength can be generated. D.L.G.

A82-10223 **Gust front structure observed by Doppler radar.** R. J. Donaldson, Jr. and C. L. Bjerkaas (USAF, Geophysics Laboratory, Bedford, MA). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 157-161. 6 refs.

Two gust fronts (April 30 and May 2, 1978) are discussed as representative samples of operational data taken during the Joint Doppler Operational Project of 1977-1979. Readings from the 10 cm Doppler radar at Norman, OK, during continuous recording at five or six elevation angles were color coded and displayed for speeds in m/s, range marked at one km intervals, and dated, with time of day indicated. Charts provided show wind direction changes with the passage of a gust front and windspeeds at 0.3 km altitude to be double that of surface wind speeds, a factor considered important for aviators. Extreme wind shears within the fronts were taken as evidence for severe vertical shears, which were not sensed by horizontally scanning radar. The effectiveness of the Doppler radar in identifying and ranging gust fronts commends it to airport use, where shears invisible to the pilot's eye can be hazardous during takeoff and approach maneuvers at low altitudes. M.S.K.

A82-10225 **The evolution of airborne weather avoidance radar toward a calibrated remote rain gauge using REACT.** J. F. Clark (RCA, Princeton, NJ). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 169-175. 5 refs.

REACT (Rain Echo Attenuation Compensation Technique) is a new digital system that compensates for precipitation attenuation in each small-range increment of each sweep by adaptively increasing the radar receiver sensitivity for the next range increment by an amount equal to the two-way attenuation through the original range increment. A Probable Ground Track and Weather Radar Plot of the Apr. 4, 1977 storm near New Hope, GA was published and used as the ground truth in plotting rainfall data. The storm was first depicted by conventional X-band and C-band radar, and the resolution and range of these bands are compared. REACT was then used with the PriMUS 708 solid-state radar; the plotted result of precipitation attenuation was shown to agree well with the assumed ground truth. The PriMUS 708 airborne radar, compensated with REACT, combines the X-band advantage of higher resolution and antenna gain with an accurate rainfall rate calibration. J.F.

A82-10292 **Multiple Doppler radar observations of PBL structure.** P. H. Hildebrand (National Center for Atmospheric Research, Boulder, CO). In: Conference on Radar Meteorology, 19th, Miami Beach, FL, April 15-18, 1980, Preprints. Boston, MA, American Meteorological Society, 1980, p. 656-661. NSF Grant No. ATM-76-24236.

It is noted that during May and June of 1977, multiple Doppler radars, aircraft and other instrumentation were used to observe the characteristics of the convectively growing planetary boundary layer (PBL) in Central Oklahoma. The observations were made between midmorning and afternoon when the PBL was growing quickly. A preliminary analysis of the data from one of the days is given. It is found that data collected using such a large radar separation appear to be usable to describe large scale PBL kinematics. C.R.

A82-10304 **Helicopter engine technology - With particular reference to the Rolls-Royce Gem engine.** D. Lewis (Rolls-Royce, Ltd., Watford, Herts., England). *Aeronautical Journal,* vol. 85, Sept. 1981, p. 313-319.

A description is presented of the design features incorporated by the Rolls-Royce Gem helicopter engine in light of the following criteria: (1) high structural strength, to withstand low frequency vibration and maneuvering loads; (2) optimization of low altitude performance; (3) operation over a wide power range; (4) high fuel efficiency at part load power; (5) fast and surge-free acceleration and deceleration; (6) insensitivity to intake pressure disturbances; (7) resistance to contaminated intake air; and (8) stability of control. It is observed that in general, the complexities introduced into helicopter engines of the last design generation to improve fuel consumption will be diminished in the next generation of engines for the sake of cost reduction. In addition to the Gem, these engines include the GE T700 and U.S. Army ATDE. O.C.

A82-10305 **The application of improved aluminium alloys and steels in aircraft structures.** C. J. Peel and D. S. McDarmaid (Royal Aircraft Establishment, Materials Dept., Farnborough, Hants., England). *(Royal Aeronautical Society, Symposium on Developments in Structures and Manufacturing Techniques, London, England, Apr. 14, 1981.) Aeronautical Journal,* vol. 85, Sept. 1981, p. 320-326. 16 refs.

It is shown that development efforts in aircraft aluminum alloys and steels over the last 20 years have generally sought to overcome such problems as a lack of resistance to fatigue and stress corrosion cracking rather than achieve increases in specific strength. Significant improvements in fracture toughness and stress corrosion resistance have been achieved, and improved surface treatments are appearing for steel products. Attention is given to new aluminum alloys resulting from the addition of up to 3 wt % Li to Al-Mg, Al-Cu, and Al-Cu-Mg systems, yielding increased stiffness and reduced density. Improvements to 2000- and 7000-series aluminum alloys, rapid solidification production techniques, and corrosion protection for aircraft steels are also covered. O.C.

A82-10306 **Design aspects of non rigid airship envelopes.** J. A. I. Reid (Airship Industries, Ltd., London, England). *(Royal Aeronautical Society, Symposium on Developments in Structures and Manufacturing Techniques, London, England, Apr. 14, 1981.) Aeronautical Journal,* vol. 85, Sept. 1981, p. 327, 328.

The design requirements of nonrigid airship envelopes are addressed in light of recent advances in both (1) the estimation of airship hull loadings under maneuvering and gusts and (2) high-strength fabrics for airship construction woven from polyamide, polyester, and Kevlar fibers. Attention is given to the degree of permeability by helium of hull and ballonet materials. When determining safety factors for use with such nonmetallic materials, a factor characterizing the degradation of material strength with age must be added to those normally associated with strength calculations. O.C.

A82-10307 **Some possibilities for composite light aircraft construction.** J. H. Webb (Cranfield Institute of Technology, Cranfield, Beds., England). *(Royal Aeronautical Society, Symposium on Developments in Structures and Manufacturing Techniques, London, England, Apr. 14, 1981.) Aeronautical Journal,* vol. 85, Sept. 1981, p. 328-331.

Alternative methods for the design and construction of light aircraft and remotely piloted vehicles with composite materials are described, with attention to the minimization of tooling, materials and construction man-hour costs. A four-seat, single-engine light aircraft is assumed for comparison of conventional metal and glass-reinforced plastic composite wing structure construction costs. Weight comparisons are also presented for three novel wing structure design concepts: (1) a tubular spar with plastic foam core and fiberglass-reinforced skin; (2) a similar arrangement incorporating a metal spar; and (3) fiberglass-reinforced plastic foam sandwich skins with a metal spar. The mixed metal/plastic composite structure is incorporated into the Machan RPV, and has proven to be satisfactory in recent flight trials. O.C.

A82-10308 **Light aircraft structural design in non-metallics - Use of composite honeycomb for light aircraft.** G. E. Woodley (Ciba-Geigy Plastics and Additives Co., Duxford, Cambs., England). *(Royal Aeronautical Society, Symposium on Developments in Structures and Manufacturing Techniques, London, England, Apr. 14, 1981.) Aeronautical Journal,* vol. 85, Sept. 1981, p. 332, 333.

Recommendations are made toward the application of high-technology prepreg composite systems for the production of nonmetallic honeycomb light aircraft structures. Attention is given to design and assembly methods for wings and control surfaces, with emphasis on the reduction of production costs rather than weight saving. It is shown that the designer's aim should cut down the honeycomb panel piece parts required, thereby reducing the man-hours cost of production, and that the use of composite honeycomb materials results in a more damage-tolerant surface than conventional light aircraft structures, with a more accurate overall shape and reductions of both corrosion and fatigue. O.C.

A82-10309 **Sophisticated aircraft structure developments - Combat aeroplanes.** R. J. Sellars and G. Terry (British Aerospace Public, Ltd., Co., Warton Div., Preston, Lancs., England). *(Royal Aeronautical Society, Symposium on Developments in Structures and Manufacturing Techniques, London, England, Apr. 14, 1981.) Aeronautical Journal,* vol. 85, Sept. 1981, p. 334-342. Research supported by the Ministry of Defence (Procurement Executive).

Comparisons of the structural materials and fabrication processes currently under development and assessment in Britain for future combat aircraft construction are presented, with attention to the demonstration of carbon fiber reinforced composites (CFC) and superplastic forming/diffusion bonding of titanium alloy (SPF/DB) in existing aircraft. CFC and SPF/DB structures are compared with respect to specific tensile and compressive strengths and moduli, specific shear strength and modulus, buckling, and ultimate design strengths and design criteria in the application of the materials to the stabilized skins of combat-aircraft surfaces. Emphasis is put on the possibility of aeroelastic tailoring that is introduced by the application of CFC to wing structures. O.C.

A82-10310 **Optimal flight paths for winged, supersonic flight vehicles - Extension to the case where thrust can be vectored.** E. Large (Marconi Space and Defence Systems, Ltd., Stanmore, Middx., England). *Aeronautical Journal,* vol. 85, Sept. 1981, p. 343-348. 5 refs.

A method for determining the optimal trajectory and thrust program of an aircraft or rocket employing vectored thrust is derived, for the practical cases in which the entire thrusting phase is supersonic. It is shown that finding the burning program which gives the Hamiltonian function a zero value automatically satisfies the optimal flight path conditions and makes the final fuel consumption independent of time. It is found that the optimal burning program is not, except in special cases, one that employs constant thrust, the general optimum instead being a linear rate of thrust increase with time. O.C.

A82-10362 # **The use of the Weber method for minicomputer-assisted numerical analysis of airfoils (Zastosowanie metody Webera do numerycznej analizy aerodynamicznej profili na minikomputerach).** K. Czyzewski and M. Lukaszewicz. *Instytut Lotnictwa, Prace,* no. 85, 1981, p. 9-21. 21 refs. In Polish.

A numerical version of the Weber method is developed for calculating pressure distribution over an airfoil in subsonic flow. The method is based on the fact that singularities representing the flow at the airfoil surface are distributed chordwise, and a correction coefficient is introduced, with allowance for airfoil thickness. If the airfoil shape is approximately represented by spline functions, numerical analysis is simplified considerably and the accuracy is improved. The present numerical results are compared with other numerical results for subcritical and supercritical flow conditions, and with wind-tunnel-test results. In addition, an iteration method for determining the critical Mach number has been developed. B.J.

A82-10363 # **Experimental study of subsonic and transonic flows past a wing (Eksperymentalne badania pod- i przydzwiekowego oplywu skrzydla).** W. Kania and A. Krzysiak. *Instytut Lotnictwa, Prace,* no. 85, 1981, p. 23-44. 10 refs. In Polish.

The paper reports aerodynamic balance measurements of aerodynamic characteristics and flow visualization tests on a plane trapezoidal uniform-section wing with a small sweepback angle. Tests were performed in a transonic wind tunnel for Mach numbers ranging from 0.3 to 0.96 under conditions of fixed boundary layer transition. Lift, drag, and pitching moment were determined, with attention given to the effect of Mach number. Shock wave formation on the wing is examined, and flow separation and drag rise are determined. Four types of flow separation, depending on Mach number, are revealed; it is found that there is a correlation between the type of flow separation and the value of the lift coefficient at the onset of separation, which depends on the Mach number. B.J.

A82-10364 # **Analytical determination of undercarriage retraction kinematics (Analityczne okreslanie kinematyki chowania podwozia).** R. Stanczak. *Instytut Lotnictwa, Prace,* no. 85, 1981, p. 45-53. In Polish.

An analytical method is developed for calculating the kinematics of undercarriage retraction. The method is particularly suitable for the design of high-wing and mid-wing monoplanes, the undercarriages of which cannot be attached to the wing. Attention is given to undercarriages with one and two rotation axes. B.J.

A82-10366 **FAA developing new collision avoidance, data acquisition and transmission systems.** A. C. Schwartz. *Airport Forum,* vol. 11, Aug. 1981, p. 93, 94, 96, 97.

The U.S. Federal Aviation Agency (FAA) is concerned with the development of an aircraft collision avoidance system which, it is hoped, will be universally accepted as an aviation standard system. The Discrete Address Beacon System (DABS) contains advanced flight and data link equipment. According to the FAA program, DABS is to become the basis for a ground-based collision avoidance system called the Automatic Traffic Advisory and Resolution Service (ATARS). However, it was recently decided to review the DABS ground station program before a final decision is made regarding the ground installations. Another decision is concerned with the implementation of an airborne collision avoidance system called Threat Alert and Collision Avoidance System (TCAS). The TCAS is to take the place of the Beacon Collision Avoidance System (BCAS). TCAS will operate independently of ground stations and use a highly directional transmitting antenna. To provide better information for en route air traffic controllers when the main radar system fails, FAA is installing the Direct Access Radar Channel (DARC) at its 20 centers in the continental U.S. G.R.

A82-10401 * # **The balloon and the airship technological heritage.** N. J. Mayer (NASA, Washington, DC). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1912.* 8 p. 7 refs.

The balloon and the airship are discussed with emphasis on the identification of commonalities and distinctions. The aerostat technology behind the shape and structure of the vehicles is reviewed, including a discussion of structural weight, internal pressure, buckling, and the development of a stable tethered balloon system. Proper materials for the envelope are considered, taking elongation and stress into account, and flight operation and future developments are reviewed. Airships and tethered balloons which are designed to carry high operating pressure with low gas loss characteristics are found to share similar problems in low speed flight operations, while possessing interchangeable technologies. D.L.G.

A82-10403 # **Air bag impact attenuation system for the AQM-34V remote piloted vehicle.** C. T. Turner (Teledyne Ryan Aeronautical, San Diego, CA) and L. A. Girard, Jr. (Goodyear Aerospace Corp., Akron, OH). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1917.* 8 p.

This paper describes the air bag impact attenuation system (ABIAS) for the AQM-34V remote piloted vehicle. The developed hardware, consisting of the main bag, tail bag, and inflation systems, is described. Operation of the system from electrical initiation, through cover deployment, main and tail bag inflation, and ground impact is discussed. Development ground drop tests, environmental tests, structural tests, and the contractor flight tests are summarized. Test results substantiated system performance. (Author)

A82-10404 # **Limiting payload deceleration during ground impact.** A. Mironer (Analytical Systems Engineering Corp., Burlington; Lowell, University, Lowell, MA), R. Urquhart (Analytical Systems Engineering Corp., Burlington, MA), and R. Walters (USAF, Geophysics Laboratory, Bedford, MA). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1918.* 7 p.

This paper considers the problem of limiting the deceleration of balloon and sounding-rocket instrument payloads during ground impact by adding energy-dissipating, deformable structures. The basic physics of the two-step deceleration/energy-dissipation process is analyzed and simple force and energy-balance relationships are developed. The pertinent equations are organized in a form that is conducive for computer computation. Two example problems, one of a sounding-rocket payload and the other of a balloon payload are calculated and the results presented in the form of a performance map. (Author)

A82-10405 # **Aerodynamics and performance of cruciform parachute canopies.** D. S. Jorgensen and D. J. Cockrell (Leicester, University, Leicester, England). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1919.* 10 p. 8 refs. Research supported by the Ministry of Defence (Procurement Executive).

Effects of changing the ratio of the arm length and width (the 'arm ratio') on the aerodynamics of cruciform (cross-shaped) parachute canopies are described. Forces and moments were determined from measurements made when fabric canopies were towed under water in a ship tank as well as from integrated pressure distributions determined by using specially-designed pressure transducers fixed in fabric wind tunnel models. Using both techniques, the existence of stochastic variations in aerodynamic behavior was investigated. Experimental results will be analysed using an appropriate computer performance model and the variation of dynamic performance characteristics thus determined as a function of the arm ratio. (Author)

A82-10406 # **Experimental determination of parachute apparent mass and its significance in predicting dynamic stability.** T. Yavuz and D. J. Cockrell (Leicester, University, Leicester, England). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1920.* 9 p. 6 refs. Research supported by the Ministry of Defence (Procurement Executive) and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt.

Experimental techniques to measure the components of the apparent mass tensor for parachutes are describd. They are evaluated by force and moment measurement during relative motion of parachutes submerged in water in a ship tank. Results show that the components depend on canopy shape, angle of attack and acceleration modulus and, except at high values of the latter, can be considerably in excess of potential flow evaluations. The effect of these results on the dynamic stability of descending parachutes is demonstrated by reference to an appropriate computer model. General conclusions are drawn relevant to canopies whose shapes differ from those tested. (Author)

A82-10407 # **Development of new lifting parachute designs with increased trim angle.** W. R. Bolton (Sandia Laboratories, Livermore, CA) and I. T. Holt (Sandia Laboratories, Albuquerque, NM). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1921.* 12 p. Research supported by the U.S. Department of Energy.

A development program is being conducted by Sandia National Laboratories on a lifting parachute system which allows aircraft delivery of a payload at high speed from low altitude. Candidate lifting parachute designs, which included ram air inflated leading edge chambers and flow-directing side vents, were evaluated in small and full-scale wind tunnel tests, in whirl tower flight tests, and in aircraft flight tests. The results of these testing activities will be discussed along with the method of using test results to predict system performance. (Author)

A82-10408 # **The effects of flexibility on the steady-state performance of small ribbon parachute models.** T. Weber (McDonnell Aircraft Co., St. Louis, MO) and W. L. Garrard (Minnesota, University, Minneapolis, MN). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1923.* 7 p. 5 refs. Research supported by the U.S. Department of Energy.

Small textile ribbon parachute models were shown to exhibit steady-state aerodynamic coefficients similar to those of rigid parachute models. Since no detailed study of the effects of model flexibility on the steady-state aerodynamic performance of a parachute model has been reported, several ribbon parachute models of varying flexibility and equal geometric porosity were constructed and tested in the wind tunnel. No correlation was found between model flexibility and measured aerodynamic performance. (Author)

A82-10409 # **Comparison of simulation and experimental data for a gliding parachute in dynamic flight.** T. F. Goodrick (U.S. Army, Natick Research and Development Laboratories, Natick, MA). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1924.* 5 p.

Comparisons are presented of descent rate, total airspeed, horizontal airspeed, yaw rate, pitch rate and roll rate between computer simulation in 6 DOF and flight data for a 200 square foot Parafoil of aspect ratio 2.0 carrying a 350-pound stabilized payload. The payload is specially designed to measure and record all essential parameters of dynamic flight independent of atmospheric wind. The comparison indicates a high degree of agreement in high-rate turns varying greatly from steady-state conditions. Thus, the 6 DOF simulation has been validated. (Author)

A82-10410 # **Theoretical analysis of parachute inflation including fluid kinetics.** J. W. Purvis (Sandia Laboratories, Albuquerque, NM). *American Institute of Aeronautics and Astronautics,* *Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1925.* 12 p. 25 refs. Research supported by the U.S. Department of Energy.

An analysis is presented for predicting parachute inflation. Equations of motion for the complete system are developed from first principles, and are solved with no experimental inputs. Ballistic equations of motion are derived for the canopy, payload, and suspension line masses. However, the enclosed fluid mass is not lumped with the canopy as an apparent mass term. Instead, the fluid conservation equations for a deforming, accelerating control volume are solved to determine the behavior of the captured fluid and its interaction with the canopy. Only first order effects are included, and the analysis is limited to inviscid, incompressible flow. Results for both porous and nonporous canopies are compared with experimental data. (Author)

A82-10411 * # **A new thermal and trajectory model for high altitude balloons.** L. A. Carlson and W. J. Horn (Texas A & M University, College Station, TX). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1926.* 10 p. 17 refs. Contract No. NAS6-3072.

A new computer model for the prediction of the trajectory and thermal behavior of high altitude balloons has been developed. In accord with flight data, the model permits radiative emission and absorption of the lifting gas and daytime gas temperatures above that of the balloon film. It also includes ballasting, venting, and valving. Predictions obtained with the model are compared with flight data and newly discovered features are discussed. (Author)

A82-10412 # **The net-skirt to a parachute canopy as a device to prevent inversion.** G. W. H. Stevens. *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1927.* 8 p. 7 refs.

The paper gives a historical account of the circumstances which led to the invention of the net-skirt extension as a device to eliminate parachute canopy inversions, in particular, partial inversions known as 'Blown Peripheries'. Because previous papers do not give a precise account of the mechanism causing the phenomenon it is reanalysed. The paper also records the trends of thought which led to the invention. The phenomenon has been completely eliminated in parachutes modified in this way. Whereas the net-skirt extension solved the difficulties with the Airborne Forces' parachuting system it does not appear to be essential for all deployment systems if adequate line tension can be maintained. Because of the paper's historical nature, Imperial units are used throughout. (Author)

A82-10413 # **The constricted rigging line trials technique for assessing the opening characteristics of parachutes.** S. A. Birch (Irvin Great Britain, Ltd., Letchworth, Herts., England). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1932.* 8 p. 7 refs.

Constricted rigging line trials of a parachute in which the relationship between the inflation time and the effective line length can be established in drop tests from an aircraft or captive kite balloon, present a simple, quick, cost effective test technique for assessing the performance of a parachute against the known performance of a similar parachute. The technique is being used by Irvin Great Britain Limited as a routine test method for man-carrying and other parachute applications. This paper describes the method of test and gives examples of applications of the technique and the results obtained. (Author)

A82-10414 # **A modular asymmetric parachute for wind tunnel testing.** P. C. Klimas, H. E. Widdows, and R. H. Croll (Sandia Laboratories, Albuquerque, NM). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1933.* 9 p. Contract No. DE-Ac04-76DP-00789.

The construction of a series of asymmetrical wind tunnel model parachutes designed to a modular concept is described. The static force, inflation force, and dynamic force and motion time history wind tunnel testing of up to 123 different configurations is discussed. (Author)

A82-10417 # **Reductions in parachute drag due to forebody wake effects.** C. W. Peterson and D. W. Johnson (Sandia Laboratories, Albuquerque, NM). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1939.* 11 p. 10 refs. Research supported by the U.S. Department of Energy.

The paper evaluates approximate analytic methods for predicting reduction in parachute drag due to forebody wake effects. Velocity distributions are measured behind realistic forebody configurations, and are compared to three turbulent wake velocity models. The velocities are integrated to determine the average effective dynamic pressure acting on the parachute, and comparisons are made of drag loss data and effective dynamic pressure ratios. Predictions are also made for no-fin and finned forebodies with 0 deg, 10 deg, and 20 deg angles of attack. The ratio of measured parachute drag behind a forebody divided by the wake free drag is found to equal the ratio of the average dynamic pressure acting on the parachute divided by the freestream dynamic pressure. Good agreement is found between wake velocity data and theoretical predictions, and the maximum angle of attack providing accurate predictions is determined. D.L.G.

A82-10420 # **Stress measurements in a ribbon parachute canopy during inflation and at steady state.** T. A. Konicke and W. L. Garrard (Minnesota, University, Minneapolis, MN). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1944.* 10 p. 9 refs. Research supported by the U.S. Department of Energy.

This paper describes the results of an experimental study of canopy stresses in a model ribbon parachute. The distribution of circumferential stress was measured during inflation and at steady state for different values of dynamic pressure. Testing was performed in the wind tunnel at the infinite mass condition. Omega sensors were used to measure stresses and were mounted in different ribbons along the gore centerline. It was found that the steady state stress had two maxima of about equal value. One maxima was near the skirt, the other half-way between the vent and skirt. The distribution of maximum stress during inflation was similar to the steady state distribution and the ratio of maximum stress during inflation to steady state stress ranged from 1.25 to 1.75 and was essentially independent of dynamic pressure. The spectral density of the steady state stress measured at several points on the canopy. (Author)

A82-10421 # **Stress measurements in bias constructed parachute canopies during inflation and at steady-state.** W. L. Garrard and T. A. Konicke (Minnesota University, Minneapolis, MN). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1945.* 10 p. 8 refs. Research supported by the U.S. Department of Energy.

This paper describes the results of an experimental study of canopy stresses in bias constructed solid flat parachutes. Stresses were measured in the warp and fill directions during inflation and at steady state for different values of dynamic pressure. Omega sensors were used to measure stress. These sensors were mounted along the gore center lines so that the warp and fill stress distributions could be determined as a function of distance from the vent. It was found that stresses in the fill direction were substantially larger than stresses in the warp direction. (Author)

A82-10425 # **Aeroballistic characteristics of sonobuoy parachute decelerators limited to a length of three feet.** C. T. Calianno (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1950.* 8 p.

Air drop and wind tunnel tests were conducted to verify the stability of sonobuoys with decelerators limited to a total length of 3 feet. This limitation was established for safety reasons. Existing decelerator systems are configured to a length of 5 to 12 feet, with cross-type canopies varying in area from 1.5 to 3.5 square feet.

Sonobuoys are blunt nose right circular cylinders, 4-7/8 inches in diameter, 36 inches long ranging in weight from 12 to 39 pounds. Testing established that 3-foot long decelerators are suitable replacements for the existing configurations. Drag coefficient, opening load, high altitude air descent characteristics, and stability data were determined for different types of decelerators with various area and length. (Author)

A82-10427 # **Development of a nylon-Kevlar recovery system for the CL-289 /AN/USD 502/ surveillance drone.** D. B. Webb and L. Palm (Irvin Industries Canada, Ltd., Fort Erie, Ontario, Canada). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1952.* 12 p.

An innovative optimized system has been developed for the automatic recovery of a small (500 lb.) high speed surveillance drone along a precise trajectory. The system requires the use of advanced materials and techniques in order to meet stringent system weight, volume and performance limitations and consists of a two stage highly pressure packed unitized parachute package plus dual landing bags. The specification weight and volume constraints made the maximum use of Kevlar material mandatory for the entire system. Other innovative techniques required included stretch fabric orifices for the landing bags and main parachute opening control features; i.e., continuously variable geometric porosity and use of a special type of auxiliary parachute (Webb chute) positioned in the mouth of the canopy. (Author)

A82-10428 # **Inflatable system for fast deployment of parachutes at low altitudes from slow moving aircraft or stationary supports.** H. O. Bucker. *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1953.* 6 p. 5 refs.

A preinflated system has been developed for fast expansion and deployment of emergency parachute canopies from buildings or slow-moving aircraft. The model is based on the concept of a quick shape recovery of restrained folded inflated flexible tubing and is tested using modified conventional circular canopies. Three suspension lines are used on buildings at altitudes as low as 25 m, with a 55 kg load. Canopies achieve full deployment at 11 m at normal landing speeds of 4.6 m/sec with a frame expansion time of 0.35 sec. Prototypes tested for slow aircraft achieve a speed of 50 km/hr, with a frame pressure of 4.3 kg/sq cm, and a deployment time of 2 sec. Results indicate that fast expansion and subsequent deployment of canopies operated with portable gas sources can be useful in such sports as hang gliding, or as emergency equipment for firemen in rescue operations. D.L.G.

A82-10455 * # **Helicopter rotor trailing edge noise.** R. H. Schlinker and R. K. Amiet (United Technologies Research Center, East Hartford, CT). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2001.* 26 p. 44 refs. Contract No. NAS1-15730.

An experimental and theoretical study was conducted to assess the importance of trailing edge noise as a helicopter main rotor broadband noise source. The noise mechanism was isolated by testing a rotor blade segment in an open jet acoustic wind tunnel at close to full scale Reynolds numbers. Boundary layer data and acoustic data were used to develop scaling laws and assess a first principles trailing edge noise theory. Conclusions from the isolated blade study were analytically transformed to the rotating frame coordinate system to develop a generalized rotor noise prediction. Trailing edge noise was found to contribute significantly to the total helicopter noise spectrum at high frequencies. (Author)

A82-10456 * # **Rotor wake characteristics relevant to rotor-stator interaction noise generation.** L. M. Shaw and J. R. Balombin (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2031.* 24 p. 23 refs.

Mean and turbulence wake properties at three axial locations behind the rotor of an aerodynamically loaded 1.2 pressure ratio fan were measured using a stationary cross film anemometer in an anechoic wind tunnel. Wake characteristics at four radial immersions across the duct at four different fan speeds were determined utilizing a signal enhancement technique. The shapes of the waveforms of the mean rotor relative and mean upwash velocities were shown to change significantly across the span of the blades. In addition, an increase in fan rotational speed caused an increase in the maximum wake turbulence intensity levels near the hub and tip. Spectral analysis was used to describe the complex nature of the rotor wake. (Author)

A82-10457 * # **Effects of vane/blade ratio and spacing on fan noise.** R. A. Kantola (General Electric Co., Power Generation Group, Lynn, MA) and P. R. Gliebe (General Electric Co., Aircraft Engine Group, Cincinnati, OH). *American Institute of Aeronautics and Astronautics, Aeroacoustics Conference, 7th, Palo Alto, CA, Oct. 5-7, 1981, Paper 81-2033.* 16 p. 11 refs. Contract No. NAS3-22062.

The effects of vane/blade ratio and spacing on fan noise are investigated to develop a fan noise prediction scheme which is calibrated against experimental data. A 44 blade, 0.504 diameter fan is used to demonstrate the production of fan noise data free from excess noise caused by rotor turbulence interaction. Two stator sets consisting of a cut-off set with 86 vanes, and a cut-on set of 48 vanes are used, with a total range of spacing from 0.5 to 2.3 rotor chords. The model includes viscous wake interaction noise and the potential field interactions of both the rotor and stator. A free-field acoustic environment is achieved by covering the walls, ceiling and floor with 0.7 m polyurethane foam wedges, providing less than + or - 1 dB standing wave ratio at 200 Hz. Only a 3 dB drop in tone level occurs as the spacing is increased from 0.5 to 2.3 rotor chords, and results indicate that the rotor wakes impinging on the stator vanes are the principal noise source for subsonic rotor speeds. D.L.G.

A82-10462 * # **Analysis of augmented aircraft flying qualities through application of the Neal-Smith criterion.** R. E. Bailey and R. E. Smith (Calspan Advanced Technology Center, Buffalo, NY). *American Institute of Aeronautics and Astronautics, Guidance and Control Conference, Albuquerque, NM, Aug. 19-21, 1981, Paper 81-1776.* 26 p. 9 refs. USAF-NASA-supported research.

The Neal-Smith criterion is examined for possible applications in the evaluation of augmented fighter aircraft flying qualities. Longitudinal and lateral flying qualities are addressed. Based on the application of several longitudinal flying qualities data bases, revisions are proposed to the original criterion. Examples are given which show the revised criterion to be a good discriminator of pitch flying qualities. Initial results of lateral flying qualities evaluation through application of the Neal-Smith criterion are poor. Lateral aircraft configurations whose flying qualities are degraded by roll ratcheting effects map into the Level 1 region of the criterion. A third dimension of the criterion for flying qualities specification is evident. Additional criteria are proposed to incorporate this dimension into the criterion structure for flying qualities analysis. (Author)

A82-10463 # **How large should a commuter transport be.** R. D. FitzSimmons, J. Seif, and S. C. Nelson (Douglas Aircraft Co., Long Beach, CA). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Conference, Dayton, OH, Aug. 11-13, 1981, Paper 81-1732.* 12 p. 11 refs.

Definitions of a commuter transport are examined from the viewpoint of a major airframe manufacturer. Selected milestones in commuter air service are reviewed. The impact of deregulation is creating new opportunities for commuter airlines to expand services, resulting in new economic and operating problems. Problems of acquisition and operating costs are discussed. Considerations for commuter transport capacity include number of passengers, frequency of service, airport facilities, and community compatibility. Capacity variations are explored in the 1980s and the 1990s. Some conceptual commuter transport candidates for the future are presented. (Author)

A82-10465 # **Design considerations for duty cycle, life and reliability of small limited life engines.** D. A. Gries (Williams International Corp., Walled Lake, MI). *AIAA, SAE, and ASME, Joint Propulsion Conference, 17th, Colorado Springs, CO, July 27-29, 1981, AIAA Paper 81-1402.* 4 p.

Design requirements, design criteria and verification methods related to preliminary design and program planning for small limited life turbine engines have significant differences from other engine technologies. Design operating life of components is defined by development test requirements, rather than mission life requirements. Interpolation between operating mission limits is required to demonstrate operating life for limited life engines rather than extrapolation of accelerated testing required for long life. Storage life requirements are very stringent. The correlation of reliability prediction versus accelerated verification testing for engines requiring extended dormant storage is being validated. (Author)

A82-10466 * # **Propfan installation aerodynamics of a supercritical swept wing transport configuration.** R. C. Smith and A. D. Levin (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 17th, Colorado Springs, CO, July 27-29, 1981, AIAA Paper 81-1563.* 14 p. 6 refs.

A semispan model with a powered propeller has been tested to provide data on the installation drag penalty of advanced propfan-powered transports designed to cruise at a Mach number of 0.8. These tests, conducted in 14-foot and 11-foot transonic wind tunnels, are a part of a NASA program to develop efficient, high-speed propellers for more fuel-efficient commercial transports for the 1990s and beyond. The model is instrumented for measuring propeller forces, wing/nacelle forces and moments, and pressure distributions over the wing and nacelle. The body in these tests was nonmetric, being connected to the wing by an RTV seal at the wing/body juncture. Tests were run at angles of attack from -3 to +5 deg over the Mach number range 0.6 to 0.85 at a Reynolds number of about 9,000,000. Results of these tests indicate that the nacelle interference drag can be quite large relative to an uninstalled nacelle. However, the losses due to the nacelle were reduced to acceptable levels by changes to the wing leading edge and nacelle intersection. The propeller slipstream causes substantial changes in the wing span load distribution indicating that twist modifications are needed to recover a more favorable span load distribution. (Author)

A82-10495 # **Characteristics and trends of energy consumption in transport missions with aircraft and surface vehicles (Caratteristiche e tendenze del consumo energetico nelle missioni di trasporto con aeroplani e con veicoli di superficie).** G. Gabrielli. *Ingegneria,* July-Aug. 1981, p. 193-198. 8 refs. in Italian.

A nondimensional factor is defined which characterizes energy consumption in transport missions. Values of this energy utilization factor are given for a number of aircraft and surface vehicles (e.g., automobiles, buses, and trains). Particular attention is given to the energy utilization factor of turbofan and turbojet aircraft. B.J.

A82-10496 # **The possibility of using deformable rubber components in landing gear (Possibilità di impiego di elementi deformabili in gomma in carrelli di atterraggio).** C. Caprile and L. Salvioni (Milano, Politecnico, Milan, Italy). *Ingegneria,* July-Aug. 1981, p. 201-212. In Italian.

A test program was devised to evaluate the use of precompressed rubber components as vibration dampers in landing gear for light aircraft. The test program is described, and dynamic and static test results are presented. A dissipationless model is developed which is shown to satisfactorily describe the behavior of the rubber components. B.J.

A82-10497 # **Problems relating to the classical rate-gyro (Problematiche relative al rate-gyro di tipo classico).** L. Borello (Torino, Politecnico, Turin, Italy). *Ingegneria,* July-Aug. 1981, p. 225-229. In Italian.

A mathematical model is developed for evaluating the accuracy of classical rate-gyros. An analysis is presented of the influence of secondary input signals associated with the angular velocity components of the platform. Ways to minimize the effects of these secondary signals are examined. B.J.

A82-10500 **Test Pilots' Aviation Safety Workshop, U.S. Naval Postgraduate School, Monterey, CA, February 25-28, 1981, Proceedings.** Workshop sponsored by the Society of Experimental Test Pilots and American Institute of Aeronautics and Astronautics. Edited by C. Tuomela (California Agricultural Aircraft Association, Sacramento, CA). New York, American Institute of Aeronautics and Astronautics, 1981. 100 p. Members, $12.50; nonmembers, $15.

Results are presented of discussions concerning existing and proposed training, equipment and methods for supplying the forecast demand for airline pilots for the period 1985-2000 from the cadre of general aviation. Areas covered include aeromedical education, training and equipment, the air traffic control system, the training and safety aspects associated with cockpit design analysis, pilot and maintenance personnel training accomplished by the fixed base operator, the effects of differences in flying qualities and performances between aircraft on safety and training effectiveness, pilot operating handbooks, regulatory aspects of pilot training and equipment, training and flight simulation programs for commercial pilots, and pilot weather knowledge. A.L.W.

A82-10545 **Implementation of AVRADCOM MM&T.** G. A. Gorline (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *ManTech Journal,* vol. 6, no. 1, 1981, p. 3-6.

The general implementation plan of the Army Aviation Research and Development Command's (AVRADCOM) efforts in manufacturing methods and technology (MM&T) programs is described. A flowchart of the implementation procedure is presented, and attention is given to several examples of implementation, including a compressor casing, a titanium casting, and aluminum PM parts. B.J.

A82-10547 **Composite main rotor tubular braided.** M. White (Kaman Aerospace Corp., Bloomfield, CT). *ManTech Journal,* vol. 6, no. 1, 1981, p. 14-16. Army-supported research.

Mechanical tubular braiding has been demonstrated to be a viable blade spar manufacturing process after the completion of a program that included preliminary design of an improved main rotor blade for the OH-58 helicopter. The blade incorporates an advanced aerodynamic shape and has as its primary structural member a Kevlar 49/epoxy spar fabricated by braiding. The achievement of an analytically acceptable blade and spar design satisfying critical structural and dynamic requirements was not hindered by braiding process constraints. B.J.

A82-10646 **Navigation task partitioning in distributed-processing avionics systems.** J. L. Center (JAYCOR, Woburn, MA). *(Institute of Navigation, National Aerospace Meeting, Warminster, Pa., Apr. 8-10, 1981.) Navigation,* vol. 28, Summer 1981, p. 93-100. 10 refs. Contract No. N62269-80-C-0146.

An approach is presented for allocating navigation tasks among multiple processors prior to detailed design and implementation. The method is based on applying rate-distortion techniques from communication theory to navigation system design. All navigation activities are broken down into elementary functions, and rate-distortion methods are used to access the impact on rms position and velocity errors of limiting communication bandwidths among elementary functions. Groups of functions that require high-bandwidth communication are assigned to the same microprocessor, while those that can perform effectively with lower-bandwidth links are separated. The method is illustrated for aircraft motion and sensor errors in the north channel. J.F.

A82-10649 * **Improving the MLS through enhanced cockpit displays.** R. S. Jensen (Ohio State University, Columbus, OH). *(Institute of Navigation, National Aerospace Meeting, Warminster, Pa., Apr. 8-10, 1981.) Navigation,* vol. 28, Summer 1981, p. 138-146. 8 refs. NASA-sponsored research.

A simulator investigation of various prediction and quickening algorithms in computer-generated forward-looking displays is presented; the algorithms are used to improve manual aircraft control on curved microwave landing system approaches. The experimental facility consisted of a Link GAT-2 simulator, a PDP 11/40 minicomputer, a high-speed graphic display, a TV camera, and a CRT monitor. Results indicate that second- and third-order predictor displays provide the best lateral performance and that intermediate levels of prediction and quickening provide the best vertical control. Prediction/quickening algorithms of increasing computational order were found to significantly reduce aileron, rudder, and elevator control responses. The conventional crosspointer displays yielded an average 2-sigma lateral error of + or - 200 over all wind conditions at 500 m from touchdown, and was therefore unable to meet FAA requirements (+ or - 22.9 m); the pictorial-preview display yielded much better results: an average 2-sigma lateral error of + or - 27 m. Neither display was able to approach the FAA specified accuracy requirement in the vertical dimension (+ or - 3.7 m). J.F.

A82-10850 **Discrete address beacon, navigation and landing system.** R. P. Crow. *(Institute of Navigation, National Aerospace Meeting, Warminster, Pa., Apr. 8-10, 1981.) Navigation,* vol. 28, Summer 1981, p. 147-162.

The Discrete Address Beacon, Navigation and Landing System (DABNLS) is an integrated system which will provide not only air traffic control surveillance data and a two-way data link of the FAA's developmental Discrete Address Beacon System, but will provide precision area navigation and versatile landing guidance with a full Category IIIc capability. The DABNLS will utilize a single pair of L-band frequencies for the discretely addressed up-link interrogations and down-link replies. A ground facility will make precise azimuth and range measurements on the bi-phase coded reply pulses, as well as digitally process the reported altitude data to obtain the aircraft's latitude/longitude and other parameters. The data will be used for navigation, collision avoidance and ATC purposes. Multiple channels would be used in terminal areas, each having elevation facilities for landing guidance. Block diagrams of the DABNLS ground subsystem and air-borne transponders are given. J.F.

A82-10816 † **Optimization of the principal design parameters of a passenger aircraft (Optimizatsiia osnovnikh proektnikh parametriv pasazhirskogo litaka).** V. S. Mikalevich, G. M. Iun, and V. M. Kuz'menko. *Akademiia Nauk Ukrain'skoi RSR, Visnik,* vol. 45, Aug. 1981, p. 39-43. 7 refs. In Ukrainian.

A82-10821 # **Strong matching method for computing transonic viscous flows including wakes and separations - Lifting airfoils.** J. C. Le Balleur (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), no. 3, 1981, p. 21-45. 46 refs. Research supported by the Direction des Recherches, Etudes et Techniques.

A method is presented for computing two-dimensional lifting steady viscous flows with wakes and possibly separations inside the viscous layer. A transonic potential calculation is used, which strongly interacts with a defect integral method. A mathematical model is also presented for matching the viscous model for averaged mean velocities with reverse flow, and for turbulent closure in nonequilibrium layers. Numerical coupling is reached through an iterative relaxation technique, and the wake geometry is calculated. The viscous mean flow is determined, and examples of applications to subsonic or supercritical airfoils are given. D.L.G.

A82-10822 # **Electrical ground testing of aircraft antistatic protection.** A. Bruere (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), no. 3, 1981, p. 47-56. 5 refs.

After a review of the methods suggested to ensure aircraft protection regarding electrostatic spurious phenomena, one describes one of the two devices developed at ONERA for ground testing of this protection. These methods give the external surface of the aircraft a conductivity sufficient enough to enable on the one hand the measurement of the surface resistivity of the protected parts even if they are coated with a finishing layer of paint, and, on the other hand, to check the good electrical continuity of each structure element and the aircraft potential reference point. (Author)

A82-10851 **Fluid power technology for the '80s.** Warrendale, PA. Society of Automotive Engineers, Inc. (SAE Proceedings P-85), 1980. 38 p. $8.00.

Aspects of energy conservation with variable displacement pumps and motors are examined, taking into account approaches for hydraulic power generation, friction loads, elastic loads, regenerative braking, gravity loads, inertia loads, variable displacement pump characteristics, integrated actuator packages, a servopump analysis, a valve analysis, and the computation of pump and motor parameters. High-efficiency hydraulic power transfer units for multisystem aircraft are discussed along with basic approaches for reducing hydraulic system noise in aircraft. A description of developments in boundary layer thrust vector control is also provided. G.R.

A82-10853 **High-efficiency hydraulic power transfer units for multisystem aircraft.** W. E. Boehringer (Douglas Aircraft Co., Long Beach, CA). In: Fluid power technology for the '80s. Warrendale, PA, Society of Automotive Engineers, Inc., 1980, p. 15-20.

Multiple pumps are generally employed to provide fully powered aircraft flight controls with a redundant power source. The prime hydraulic source is, in most cases, a pump driven directly by one of the aircraft's engines. This approach provides the most efficient method of converting engine horsepower to hydraulic horsepower. The secondary hydraulic power source is generally not as efficient. Investigations were conducted with the objective to find sources of alternate hydraulic power with improved efficiency. The reasons for the inefficiency of current secondary hydraulic power sources were explored to obtain a basis for the design of systems with a better performance. A unit consisting basically of two hydraulic cylinders mounted back to back was designed and manufactured. The design of this unit was subsequently further improved. It is pointed out that the new hydraulic power transfer units obtained have a comparatively high running efficiency. G.R.

A82-10854 **'Quiet please'.** S. J. Skaistis (Sperry Corp., Sperry Vickers Div., Troy, MI). In: Fluid power technology for the '80s. Warrendale, PA, Society of Automotive Engineers, Inc., 1980, p. 21-26.

The considered investigation has the objective to indicate that noise control is the product of good engineering. It does not depend on learning a whole new discipline nor does it depend on invention. Because of the increasing use of hydraulics and the growth of noise sensitivity in aircraft, it was felt that aircraft hydraulic engineers should be aware of the desirability of noise control. A booklet was written for the general practitioner in aerospace hydraulics engineering. The first principle of quieting is that the most favorable cost-effectiveness ratio is achieved when noise control engineering is part of the original design effort. The second principle of quieting is that the loudest noise component must be reduced before appreciable quieting can be achieved. G.R.

A82-10855 **Developments in boundary layer Thrust Vector Control.** R. E. Fitzgerald and R. F. Kampe (Chandler Evans, Inc., West Hartford, CT). In: Fluid power technology for the '80s. Warrendale, PA, Society of Automotive Engineers, Inc., 1980, p. 27-35. 7 refs.

Thrust Vector Control (TVC) is commonly employed on a vehicle to provide larger magnitude steering forces during low velocity flight than can be obtained with aerodynamic fins. A method of thrust vectoring called boundary layer thrust vector control (BLTVC) is considered. BLTVC involves a variation of the secondary injection procedure. The limited deflection and flow ratio is amplified by means of an approach including an injection into a highly overexpanded nozzle. Deflections of 15 degrees are possible and ambient air is used as the injectant. Attention is given to the principles of BLTVC operation, a breakthrough in reducing nozzle size, and a scheme for producing roll control. Rocket applications of BLTVC cover a range in size from microthruster to remote piloted vehicle booster. BLTVC can be used on aircraft gas turbines also. Drawbacks of BLTVC are related to the necessity to employ very large nozzles for high-altitude applications. These drawbacks can be overcome with the aid of Confined Jet Thrust Vector Control. G.R.

A82-10889 # **A new APU for medium place aircraft environmental control systems.** C. Rodgers (Solar Turbines International, Turbomach Div., San Diego, CA). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-1.* 7 p. Members, $2.00; nonmember, $4.00.

New small auxiliary power units (APU) are sought to provide aircraft pneumatic power for environmental control and start systems. A new small gas turbine APU in the 20-50 hp class has been developed to meet the smaller aircraft secondary power requirements. The Gemini APU utilizes a single-stage radial compressor and a single-stage radial turbine wheel; it incorporates a single-can combustor with a unique spinning cup fuel atomizer. The electrical control provides for shutdown in case of malfunctions and also has an automatic bleed load control system. The load control valve permits greater operational flexibility by modulating flow to maintain rated turbine exhaust temperature under varying electrical loads. The engine is available in two configurations: one for combined bleed/shp applications and the other for shaftpower applications. Silent power versions of the Gemini military ground generator sets have been developed which produce an overall noise level as low as 60 dB, and fuel and oil requirements for the Gemini are compatible with those of most main propulsion gas turbines. Successful starting has been demonstrated by the APU from -65 F through 125 F, as well as through 2000 start-stop cycles. J.F.

A82-10890 # **Closed loop environmental control systems for fighter aircraft.** G. S. Tsujikawa and V. K. Rajpaul (Boeing Military Airplane Co., Seattle, WA). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-2.* 6 p. Members, $2.00; nonmembers, $4.00. USAF-sponsored research.

A favorable thermal environment for aircraft avionics implemented in an energy efficient manner is an important factor in reducing aircraft life cycle costs through improved avionic reliability. This paper discusses the application of closed loop environmental control systems (CECS) to a tactical mission aircraft. The specific objective was to determine CECS configurations which would provide significant savings in fuel consumption and life cycle costs while maintaining stable, low temperature, clean and dry environment for avionics equipment. Preliminary designs were developed for a positive displacement rotary vaned air cycle machine system, hybrid air/vapor cycle system, centrifugal Freon compressor vapor cycle system and a turbo-machinery air cycle machine system. System characteristics, details of design, performance and life cycle cost data were compared with an existing open loop air cycle system. The study showed that closed loop system configurations and close avionic temperature control resulted in substantial life cycle cost savings. (Author)

A82-10892 # **Towards minimum power for environmental control in transport aircraft.** D. Pierrepont (British Aerospace Public, Ltd., Co., Weybridge, Surrey, England). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-4.* 7 p. Members, $2.00; nonmembers, $4.00.

The minimization of the power consumed by the pneumatically powered environmental control system (ECS) on board transport aircraft, primarily the air conditioning system, is considered. It is noted that the development of a low-bleed ECS with subzero air cycle machine exit temperatures, condensing heat exchangers and recirculation leading to the doubling of the temperature difference between the fresh air supply and passenger and crew compartments has resulted in the halving of the fuel penalty associated with the ECS, (from 4% to 2%) while an additional halving of the penalty is possible by further reducing air flow or using a shaft-driven centrifugal compressor to provide the fresh air supply. Relative fuel savings to be had from air bleed reduction are shown to be significant with respect to those to be obtained in the areas of engines, aerodynamics and structures. The minimum fresh air flow required for the efficient operation of air supply systems within limits of passenger health and comfort is considered, and pneumatic and electrical means for the transmission of shaft power to the ECS are compared. The operating principles of air- and vapor-cycle cooling systems are then reviewed with respect to their performances, and advantages of the air cycle in the areas of complexity, maintenance and weight are noted. Consideration is also given to alternatives to bleed for anti-icing applications. A.L.W.

A82-10893 # **Design analysis of high temperature transparent windshields for high performance aircraft.** V. E. Wilson, A. J. Bockstahler (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA), and C. A. Babish, III (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-5.* 11 p. 10 refs. Members, $2.00; nonmembers, $4.00. Contract No. F33615-68-C-3421.

Design criteria and analysis methods that are required to extend the thermal performance capabilities of lightweight, large field-of-view transparent windshield systems of Air Force aircraft into the Mach 2.5 to 3.5 speed regime are developed and demonstrated. Windshield system design requirements are established and designs are developed, analyzed, and revised in an iterative process until visual, structural, thermal, weight, and cost analyses show that the design requirements are satisfied. Design details on two windshield systems are presented. Because a successful windshield design for high speed aircraft depends, to a great extent, on the ability of the windshield to withstand the high temperatures associated with supersonic flight, the aerothermodynamic analysis method and results are emphasized. (Author)

A82-10894 # **Design challenges of high performance aircraft POD EOCM cooling systems.** R. D. Buckingham (Fairchild Industries, Inc., Fairchild Stratos Div., Manhattan Beach, CA). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-6.* 7 p. Members, $2.00; nonmembers, $4.00.

Modern high performance aircraft and associated Electro-Optical/Countermeasure (EOCM) pods have introduced very complex, high heat density electronics and avionics equipment, which requires mechanically refrigerated cooling to reject large amounts of heat from relatively small confined areas because of: insufficient/no cooling air from the host aircraft; miniaturization/high heat density of electronics; high temperature heat sink of high performance fighter-type aircraft, precluding ram air cooling; need for increased electronics/avionics reliability through lower operating temperature ranges. Electrically driven vapor compression systems are most effective for the EOCM-type pod missions, operating well at high and low altitudes, as well as at high and low flight speeds. Vapor cycle systems provide full ground cooling performance capability. (Author)

A82-10895 # **Air supply system bite for Boeing 767 airplane.** J. P. Patrick and G. F. Atkinson (United Technologies Corp., Hamilton Standard Div., Windsor Locks, CT). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-7.* 7 p. Members, $2.00; nonmembers, $4.00.

Modern airplane air supply systems regulate the temperature and pressure of engine bleed air extracted for cabin pressurization, air conditioning, anti-icing, cross-engine starting, air-driven hydraulic pumps and other pneumatic demands. The air supply system for the Boeing Model 767 airplane consists of a set of equipment for each of the airplane's two engines and a remotely located built-in-test-equipment (BITE) module. The air supply BITE system isolates over 95 percent of all failures to the line replaceable unit (LRU) level. The BITE system achieves this fault isolation via a modern digital electronic BITE module that continuously monitors inputs on a time-shared basis from dedicated BITE elements which are integrally contained in the air supply system LRUs. The operation of the all-pneumatic bleed air supply system is unaffected by the BITE system. Faults detected during bleed air system operation are stored in the BITE module nonvolatile memory for interrogation by the ground crew. Provisions are also made to allow BITE detected faults to be used as inputs to aircraft airborne integrated data systems (AIDS). (Author)

A82-10896 # **Air-film cooling returns to ramjets.** W. E. Roberts and S. Wasserberg (Marquardt Co., Van Nuys, CA). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-8.* 6 p. Members, $2.00; nonmembers, $4.00.

A ramjet engine was configured for the Navy Firebrand program to propel an antiship target missile. After years of using insulation to thermally protect engine combustor/nozzle assemblies, air-film cooling was used in the Firebrand engine. A combustor liner causes a layer of cool air to be injected between the combustion gas and combustor/nozzle structural shell. As this film flows downstream, mixing and reaction with combustion gas causes its cooling effectiveness to deteriorate. A satisfactory structural design requires shell temperature prediction. Using three film cooling correlations, a method of defining the Firebrand film cooling effectiveness is shown. Thermal models are presented which utilize this effectiveness and provide shell temperature predictions under ground test conditions. This analytical method is shown to be sufficient when predicted temperatures are compared with shell temperatures measured during these ground tests. (Author)

A82-10901 # **In-situ calibration of flight heat transfer instrumentation.** H. W. Kipp and E. A. Eiswirth (McDonnell Douglas

Astronautics Co., St. Louis, MO). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-ENAs-13.* 5 p. 8 refs. Members, $2.00; nonmembers, $4.00.

In-situ calibration offers a promising approach for economically minimizing errors in surface heating rates obtained from subsurface, transient, temperature measurements. Experience has shown that surface heat flux solutions are sensitive to inaccuracies in variables such as thermocouple location, temperature measurements, model thermal properties and joint conductances. It is the purpose of in-situ calibration to determine the values of finite difference thermal model parameters which result in the least square error solution. A calibration heat flux is imposed on the surface surrounding a thermocouple installation and the thermal response is recorded. The temperature history is used in an inverse solution to obtain the surface heat flux which is then compared with the calibration pulse. Repetitive values of surface heat flux are obtained by systematically varying model parameters until the calculated and calibration fluxes agree within a prescribed tolerance. The concept is illustrated with a numerical example. (Author)

A82-10920 # **Air-freon integrated environmental conditioning system for trainer subsonic aircraft.** M. Andriano, A. Mannini, and V. Marchis (Microtecnica-Torino, Turin, Italy). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, San Francisco, CA, July 13-15, 1981, Paper 81-FNAs-33.* 7 p. Members, $2.00; nonmembers, $4.00.

Development studies of a cabin environmental control system (ECS) for a new trainer subsonic aircraft are presented. The new vapor cycle cooling system is energy efficient for engines sensitive to bleed air extraction. The hybrid air-freon ECS is composed of four subsystems: the recirculation loop, the bleed air line, the ram air line, and the supplementary cooling assembly (SCA). The air system emergency control law and the SCA system emergency control law are shown schematically in flow charts: if the sensor in the recirculating loop duct measures a temperature higher than 100 C, the bypass valve is immediately closed; it is only opened if the duct temperature decreases below 70 C. The compressor in the SCA system is switched off in cases where the pressure is above 2.5 MPa and lower than 0.3 MPa. Performance tests correlated well with predicted ones, and the system overall weight was optimized at 30 kg. The ECS was compared with the bootstrap air system and found to have a substantially better bleed air flow rate (ECS = 1.20 kg/min; bootstrap = 7.0 kg/min). J.F.

A82-10934 * # **Multiple-scale turbulence modeling of free turbulent flows.** G. Fabris and P. T. Harsha (Science Applications, Inc., Combustion Dynamics and Propulsion Technology Div., Canoga Park, CA). *American Society of Mechanical Engineers and American Society of Civil Engineers, Joint Applied Mechanics, Fluids Engineering, and Bioengineering Conference, University of Colorado, Boulder, CO, June 22-27, 1981, ASME Paper 81-FE-20.* 11 p. 28 refs. Members, $2.00; nonmembers, $4.00. Contract No. NAS1-15988.

As part of an investigation into the application of turbulence models to the computation of flows in advanced scramjet combustors, the multiple-scale turbulence model has been applied to a variety of flowfield predictions. The model appears to have a potential for improved predictions in a variety of areas relevant to combustor problems. This potential exists because of the partition of the turbulence energy spectrum that is the major feature of the model and which allows the turbulence energy dissipation rate to be out of phase with turbulent energy production. To establish the general reliability of the approach, it has been tested through comparison of predictions with experimental data. An appreciable overall improvement in the generality of the predictions is observed, as compared to those of the basic two-equation turbulence model. A Mach number-related correction is found to be necessary to satisfactorily predict the spreading rate of the supersonic jet and mixing layer. (Author)

A82-10952 * # **Thermal and flow analysis of a convection, air-cooled ceramic coated porous metal concept for turbine vanes.** F. S. Stepka (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug. 2-5, 1981, ASME Paper 81-HT-48.* 7 p. 9 refs. Members, $2.00; nonmembers, $4.00.

Analysis was made of the heat transfer and pressure drop through turbine vanes made of a sintered, porous metal coated with a thin layer of ceramic and convection cooled by spanwise flow of cooling air. The analysis was made to determine the feasibility of using this concept for cooling very small turbines, primarily for short duration applications such as in missile engines. The analysis was made for gas conditions of approximately 10 and 40 atm and 1644 K and with turbine vanes made of felt-type porous metals with relative densities from 0.2 and 0.6 and ceramic coating thicknesses of 0.076 to 0.254 mm. (Author)

A82-10965 # **Fuel for future transport aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, CA). *American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug. 2-5, 1981, ASME Paper 81-HT-80.* 8 p. 6 refs. Members, $2.00; nonmembers, $4.00.

Despite attempts at conservation and the development of synthetic aviation-grade kerosene from alternative fossil fuel materials, it is widely recognized that alternatives to conventional petroleum-base aircraft fuels must become available in the near future. The present paper discusses the prospects for liquid hydrogen as a future fuel for transport aircraft. Advantages of liquid hydrogen over synthetic fuels and liquid methane as alternative fuels in the areas of availability, safety, pollution, relative energy efficiency as a function of trip length and aircraft weight, overall costs and airport compatibility are considered. The possible requirements for a development program aimed at preparing liquid hydrogen for use in operational aircraft are examined, and the probable time characteristics of fuel use during the transition to liquid hydrogen, which may significantly replace synthetic fuels by the year 2000, are considered. A comprehensive plan for liquid hydrogen fuels R&D is then presented which is currently being considered for implementation on an international basis. A.L.W.

A82-10985 # **Control laws for adaptive wind tunnels.** E. H. Dowell (Princeton University, Princeton, NJ). *AIAA Journal,* vol. 19, Nov. 1981, p. 1486-1488. 5 refs. Research supported by Princeton University.

A control law is developed which will permit the systematic modification of wind tunnel wall conditions, in order to minimize the interference about a model. The approach is valid for both three-dimensional and lifting flows and, subject to the assumption of linearity, is not dependent on any particular theoretical description of the fluid. In addition, unlike previous control schemes, the present method does not require an iterative approach. O.C.

A82-10987 # **Wind tunnel tests on airfoils in tandem cascade.** S. Raghunathan (Belfast, Queen's University, Belfast, Northern Ireland), C. P. Tan, and N. A. J. Wells. *AIAA Journal,* vol. 19, Nov. 1981, p.1490-1492.

Wind tunnel tests on airfoils in tandem cascade, of the type found on the Wells-type turbine, were conducted in a low-speed tunnel with a maximum air velocity of 35 m/sec. Airfoils tested had a chord of 85 mm and a span of 100 mm and included the NACA 0012, 0018 and 0021 profiles. The freestream dynamic pressure was measured upstream of the cascade by a Pitot tube, as well as the tangential and normal forces on the blades. Tests were performed for several cascade solidities and at angles of incidence varying from zero to 90 deg, with Reynolds numbers of about 100,000. O.C.

A82-11020 **Tangential sensitivity of EW receivers.** J. Tsui (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). *Microwave Journal,* vol. 24, Oct. 1981, p. 99-102. 8 refs.

A systematic approach to the determination of the tangential sensitivity of a receiver is presented, and calculated results are compared with experimental data. Particular consideration is given to the following topics: the practical determination of the effective noise bandwidth to be used in the sensitivity calculations of an EW receiver; the influence of the RF gain in the receiver on the sensitivity; and the influence of the RF bandwidth and the video bandwidth on the sensitivity. B.J.

A82-11031 **Relationships between naval aviation safety and pilot flight experience.** M. S. Borowsky (U.S. Naval Safety

Center, Norfolk, VA). *Aviation, Space, and Environmental Medicine,* vol. 52, Oct. 1981, p. 606-610.

Flight activity of all aviators flying naval aircraft and aircraft accident data were analyzed to determine if statistical relationships among lifetime and recent experience variables and accident liability exist. The results demonstrate that accident potential, though not statistically related to flight hours in 30-d periods, is correlated with lifetime flight experience with the higher liability associated with minimal amounts of flight hours and with transitioning into new aircraft. (Author)

A82-11149 **Acoustic emission - An emerging technology for assessing fatigue damage in aircraft structure.** C. D. Bailey and W. M. Pless (Lockheed-Georgia Co., Marietta, GA). *Materials Evaluation,* vol. 39, Oct. 1981, p. 1045-1050. 12 refs.

Guidelines for the design of a dedicated acoustic emission (AE) system for aircraft fleet installations are discussed. It is shown that the successful development of an on-board AE crack detection system depends on the existence of an integrated body of technology combining AE detection technology, structural and crack growth characteristics, noise and EMI discrimination or rejection, and fleet maintenance practices. These technologies must be fully integrated through the development and deployment of the system to achieve cost-effective results. V.L.

A82-11177 * **Rheological behavior of progressively shear-thickening solutions.** S. T. J. Peng and R. F. Landel (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *Journal of Applied Physics,* vol. 52, Oct. 1981, p. 5988-5993. 13 refs. Contract No. NAS7-100.

The rheological behavior of the recently developed polymer FM-9 in Jet A fuel and JP 8 fuel is reported. In aqueous solution, FM 9 is found to exhibit strong time-dependent shear thickening behavior. Induction time necessary for the onset of thickening is found to depend on shear rate, solvent, concentration, and molecular weight. Altering the nature of the solvent results in effects similar to those obtained by changing the concentration or molecular weight. A critical shear rate is derived, and is inversely proportional to the zero shear rate viscosity of the solution for the temperature and concentrations observed. The onset of shear thickening behavior appears to be related to the onset of viscoelastic response, and thus the time scale follows reduced variable behavior. D.L.G.

A82-11222 **Development of the Triflex rotor head.** A. Cassier (Société Nationale Industrielle Aérospatiale, Marignane, Bouches-du-Rhône, France). *American Helicopter Society, Journal,* vol. 26, July 1981, p. 25-31.

This paper reviews the development of a new hingeless rotor hub named Triflex. This hub is made of composite materials and features flexible arms that provide blade retention, flap/lag/pitch degrees of freedom through structural deflection, and lag damping. A large part of the Triflex hub design effort has been devoted to determination of the flexible arm characteristics, since these strongly affect the behavior of the rotor in flight. The Triflex hub dynamic characteristics were carefully checked during laboratory and whirl stand tests and found to be in agreement with theoretical predictions. Flight tests of the Triflex rotor on a Gazelle helicopter were successful in demonstrating the feasibility of the concept. Though rotor lag damping was found to be weak, no insurmountable stability problems were encountered, and the flying qualities of the Gazelle helicopter fitted with the Triflex hub were good. The next phase of the Triflex hub development will be aimed at improving the hub's structural damping characteristics and at optimizing the manufacturing process. (Author)

A82-11224 **Fatigue substantiation of non-linear structures.** B. P. W. Stocker (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *(American Helicopter Society, Midwest Region Helicopter Fatigue Methodology Specialists Meeting, St. Louis, MO, Mar. 1980.) American Helicopter Society, Journal,* vol. 26, July 1981, p. 51-55.

Structures such as preloaded joints and lugs frequently exhibit non-linear load/stress relationships at critical locations. This paper presents some examples of such structures, including typical attachment lugs and preloaded threaded attachments, to illustrate the importance of test load level selection and determination of load vs stress relationships at fracture origins. The possibility that accelerated fatigue testing may sometime fail to reveal critical design weaknesses or result in unrepresentative modes of fracture is explored, and simple ways of avoiding this problem are discussed. (Author)

A82-11226 **On computing Floquet transition matrices of rotorcraft.** G. H. Gaonkar, D. Sastry (Indian Institute of Science, Bangalore, India), and D. S. S. Prasad (National Aeronautical Laboratory, Banglore, India). *American Helicopter Society, Journal,* vol. 26, July 1981, p. 56-61. 23 refs.

There are conflicting claims concerning the efficiency of different schemes of computing the Floquet transition matrices of rotorcraft. In this paper, computer-generated data are presented on the comparative efficiency of four classes of methods: (1) Runge-Kutta one-step; (2) Hamming's predictor-corrector multistep; (3) Bulirsch-Stoer extrapolation; and (4) hybrid or variable order. Data pertain to single-pass and N-pass schemes for four flap-lag stability models. It is found that Hamming's fourth-order predictor-corrector method in single pass is the most economical with respect to three-significant-figure accuracy. The analytical formulation confirms the advantage of the single-pass approach over the N-pass, provides useful approximations to machine-time data, and is a feasible economical approach to comparing different methods with respect to machine time. B.J.

A82-11300 **Model helicopter rotor impulsive noise.** J. E. Hubbard, Jr. and W. L. Harris (MIT, Cambridge, MA). *Journal of Sound and Vibration,* vol. 78, Oct. 8, 1981, p. 425-437. 18 refs. Contract No. DAAG29-C-027.

An investigation of helicopter rotor blade slap was performed on a 1.27 m diameter model rotor. The rotor blades were a NACA 0012 section with a -8 deg linear twist. The experiments were conducted in the MIT Anechoic Wind Tunnel. The effects of number of blades, blade pitch, advance ratio, and shaft angle on the generation and intensity of blade slap have been investigated. The effect of each parameter was determined by varying the parameter of interest while keeping the others constant. The rotor tip speeds of the tests performed in this study were limited to approximately Mach 0.4. The directivity associated with the blade slap signature was measured. The results of this investigation are based on a subjective definition of blade slap. (Author)

A82-11302 # **Ideal and simulated performance of an aircraft in the terrain following mission.** U. R. Prasad (Indian Institute of Science, Bangalore, India) and B. S. Subrahmanyam. *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 13-19. 8 refs.

A new synthesis method of terrain following system design to realize closely the ideal performance obtainable from an aircraft in the mission is presented. Ideal performance analysis and division of the mission into Avoid and Follow modes of flight leads to natural template constructions imbedding the aircraft climb performance and human pilot tolerance limits to accelerations. Simulation of aircraft flight in the mission complements the analysis in fixing the configuration and parameters of the system. Step terrains are used in the design iterations of the system because of their worst-case character. (Author)

A82-11314 # **Dynamic response of aircraft structure to gun shock loads.** P. N. Raju and V. P. Rangaiah (Hindustan Aeronautics, Ltd., Bangalore, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 103-105. 5 refs.

The dynamic response of a fighter aircraft to gun firing is assessed, the vibration levels on the airframe being measured by flight tests of the aircraft in the development phase. The aircraft is instrumented for measuring the vibration levels at various points on the aircraft structure, for example, the wing tip, fuselage, tail plane, and aileron and elevator. The flight vibration data thus obtained is analyzed using standard methods available in the literature. The analyzed data is plotted to ascertain whether the vibration levels fall below the upper bounds of the envelope drawn from the previous flight-test data for the aircraft of the same class. C.R.

A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

A82-11359 **Nonlinear prediction of subsonic aerodynamic loads on wings and bodies at high angles of attack.** P. Zhu, W. Shou (China Aeronautical Establishment, Institute of Computing Technology, Xi'an, Shaanxi, People's Republic of China), and S. Luo (Northwestern Polytechnical University, Xi'an, Shaanxi, People's Republic of China). *Computer Methods in Applied Mechanics and Engineering,* vol. 26, June 1981, p. 305-319. 6 refs.

This paper predicts numerically the nonlinear aerodynamic loads on wings and bodies at high angles of attack in subsonic flow separating along certain known lines. It is assumed that the separation vortices are symmetric and unbursting. The wing mean surfaces and body surfaces are simulated by bound vortex lattices, and the separation vortex surfaces by free vortex lines. The vortex system satisfies boundary conditions on wing and body surfaces, separation conditions, and the condition that free vortex lines are tangent to local velocity. The velocity induced by a vortex is computed by the Biot-Savart law with Göthert transformation for subsonic small perturbation flows. The vortex strengths and the free vortex locations are solved by relaxation method. Then the aerodynamic loads on wings and bodies are computed. They agree well with experimental tests. (Author)

A82-11400 **A note on fatal aircraft accidents involving metal fatigue.** G. S. Campbell (National Aeronautical Establishment, Ottawa, Canada). *International Journal of Fatigue,* vol. 3, Oct. 1981, p. 181-185. 6 refs.

A world-wide survey of aircraft accidents was taken to determine the extent to which metal fatigue is responsible for the incidents. A total of 306 fatal accidents since 1934 were found to be either wholly or partially due to metal fatigue; these accidents resulted in 1803 deaths. Two-thirds of the accidents involved fixed-wing iarcraft, with wing failure (88 accidents) being the most common cause, followed by engine failure (56 accidents). Of the 90 fatal helicopter accidents, about a third were due to failure of the main-rotor system, and a quarter were due to tail-rotor failure. Over the last four years there has been an average of 18 fatal accidents per year resulting from metal fatigue; about 11 have been for fixed-wing aircraft and seven have been for helicopters. Thirteen accidents were attributed to a failure to increase the inspection frequency required for aircraft used in a role for which they were not originally designed. J.F.

A82-11406 **A mathematical model of an over-sea airborne UHF radio link.** T. Slator. *Marconi Review,* vol. 44, 2nd Quarter, 1981, p. 101-118. 9 refs.

A mathematical model is described which enables the performance of an over-the-sea airborne UHF radio link to be estimated as a function of terminal height and separation distance taking account statistically of variations of signal level caused by such factors as irregular antenna radiation patterns and a rough sea surface. (Author)

A82-11407 **Optical sensors for displacement measurement.** S. M. McGlade. *Marconi Review,* vol. 44, 2nd Quarter, 1981, p. 119-136. 7 refs.

A measurement system consists of sensors which are connected to a control center. The use of fiber optics as the communications link has a number of advantages. Two of the most important are immunity from electromagnetic interference and the elimination of the danger of electrical sparking in explosive environments. These advantages are reduced by the necessity to use electrical devices in the sensors. If the sensors were wholly optical then the advantages of fiber optics would apply to the entire system outside the control center. Optical sensors will be difficult to develop. Initially, at least, they are only justified in applications where such methods are becoming essential. One such area is in military aircraft. An optical displacement transducer can be obtained by using the displacement to alter the transmission aperture of a light beam. Attention is also given to strain measurement using two beam interferometry, Fabry-Pérot interferometry displacement measurement, and strain induced birefringence. G.R.

A82-11434 **End losses in turbine cascades with porous cooling.** V. M. Epifanov and V. I. Gus'kov. *(Aviatsionnaia Tekhnika,* no. 3, 1980, p. 46-49.) *Soviet Aeronautics,* vol. 23, no. 3, 1980, p. 38-41. 7 refs. Translation.

Experimental results on porous-cooled turbine blades are presented and discussed. Exit losses in the blades are found to depend on coolant flowrate and the degree of roughness of the porous surface. B.J.

A82-11444 **Study of reingestion of exhaust gases with different initial temperature in a reversed turbojet engine.** Z. V. Akhtiamov and M. Sh. Giliazov. *(Aviatsionnaia Tekhnika,* no. 3, 1980, p. 101-103.) *Soviet Aeronautics,* vol. 23, no. 3, 1980, p. 87-89. Translation.

A82-11446 **Results of experimental study of heat transfer to turbine blades with porous cooling.** S. G. Dezider'ev, A. G. Karimova, and V. I. Lokai. *(Aviatsionnaia Tekhnika,* no. 3, 1980, p. 109-112.) *Soviet Aeronautics,* vol. 23, no. 3, 1980, p. 97-99. 6 refs. Translation.

A82-11448 **One reason for the onset of high-frequency self-excited oscillations.** V. P. Pavlovskii. *(Aviatsionnaia Tekhnika,* no. 3, 1980, p. 116-118.) *Soviet Aeronautics,* vol. 23, no. 3, 1980, p. 104-106. 5 refs. Translation.

Experiments have been carried out to investigate generation mechanisms of high-frequency auto-oscillations resulting from an increase in the pressure differential across the combustion chamber injectors of a flight vehicle engine. It is found that a possible reason for the onset of the high-frequency auto-oscillations is breakdown of the annular gas cavity in the oxidizer injector nozzle which initiates unstable combustion due to the vapor phase removal. V.L.

A82-11459 **Calculation of aerodynamic characteristics of jet flapped airplane.** V. G. Akent'ev and V. V. Guliaev. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 3-6.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 1-4. Translation.

A numerical method is developed for calculating the steady-state aerodynamic characteristics of an aircraft with jet flaps. The flow past the aircraft and the jet are modeled as a system of oblique horseshoe-shaped vortices, and the problem is solved in the linear formulation for an incompressible medium. B.J.

A82-11462 **On low-speed wind tunnels with deformable boundaries.** A. A. Gruzdev. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 23-26.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 18-20. 7 refs. Translation.

Attention is given to the development of self-streamlining or self-correcting wind tunnels. Linear theory under the assumption of potential flow is used to study the shape of streamline surfaces near a wing of finite aspect ratio moving near a screen. The characteristics of flow macrostructure in the wake are analyzed; and it is shown that, in contrast to the case of two-dimensional flow, it is not possible to streamline the walls of the tunnel in the absence of a vortex wake in the case of three-dimensional flow. B.J.

A82-11463 **Basic problem of aircraft gasturbine engine analytic design. II.** Iu. V. Kozhevnikov, V. O. Borovik, V. S. Ivanov, V. A. Talyzin, I. N. Agliullin, and Iu. V. Meluzov. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 27-32.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 21-24. Translation.

The paper presents results of the analytical optimization of the basic thermogasdynamic parameters of the cycle and the characteristic areas of the air path of a turbojet bypass engine; the optimization criterion is minimum engine-mass and minimum fuel required for a given flight distance. The multimode character of engine operation is analyzed. B.J.

A82-11464 **Formation of triangular-element stiffness matrix using sliding interpolation.** P. D. Levashov. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 33-37.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 25-28. Translation.

The paper examines the use of sliding interpolation to construct the stiffness matrix of triangular elements of flat rib-stiffened panels. This approach makes it possible to raise the order of the displacement field by employing computational parameters from adjacent elements without increasing the total number of unknowns. A computational example is discussed. B.J.

A82-11465 **On evaluating the influence of local disruptions of flow over trailing edge and leading edge flaps from the data of wind tunnel tests of a rectangular wing segment.** A. I. Matiazh, V. A. Sterlin, A. B. Kuznetsov, V. V. Isaev, A. A. Shapiro, and E. M. Ksenofontova. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 38-42.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 29-32. 5 refs. Translation.

Equipment for the suspension and control of leading and trailing flaps was tested in a low-speed wind tunnel. The influence of the control mechanisms, and, of their positions along the wing span and in the cross section, on the integral aerodynamic characteristics of a rectangular wing was evaluated. It is found that local disturbances of flow past leading and trailing flaps produce a significant reduction of lift and an increase of drag. B.J.

A82-11468 **On the use of carbon composites in slat and stabilizer construction.** B. N. Kornev, R. I. Guseva, and V. A. Tikhomirov. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 72-74.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 59, 60. Translation.

Glass-graphite-plastic composite materials were used in the construction of aircraft deflectors and stabilizers. This paper reviews the details of construction, and examines static-load testing results for both deflector and stabilizer. B.J.

A82-11469 **Synthesis of system for evaluating gyrostabilizer state with unknown disturbances.** A. A. Leporskii. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 74-76.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 61-63. Translation.

A82-11470 **On the question of trailing airplane motion.** A. A. Novad. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 79-81.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 67, 68. Translation.

Equations are derived for the three-dimensional motion of an aircraft and are solved analytically for the initiation of banking flight. The solution describes the effect of the specific wing load on the normal acceleration overloading of the aircraft. It is noted that the danger of a spin increases with increasing specific load. B.J.

A82-11471 **Experimental study of empennage snap-through vibrations.** V. A. Pavlov, F. Sh. Khakimullin, A. Ia. Gur'ianov, and M. I. Gershtein. *(Aviatsionnaia Tekhnika,* no. 4, 1980, p. 81-84.) *Soviet Aeronautics,* vol. 23, no. 4, 1980, p. 69-71. 5 refs. Translation.

The snap-through oscillations of a rectangular-planform empennage model were studied in a subsonic wind tunnel. The aim of the study was to isolate the snap-through oscillations from all other possible oscillations in the flow. An analysis of changes of the normal and frontal curvatures of the control surface demonstrate the occurrence of snap-through oscillations. The frontal curvature falls to practically zero in the case of static snap-through. B.J.

A82-11685 **Fatigue life of lugs under service loading - Test results and predictions.** A. Buch and A. Berkovits (Technion - Israel Institute of Technology, Haifa, Israel). *Materialprüfung,* vol. 23, Oct. 1981, p. 344-348. 27 refs.

Aircraft pin-lug joints with and without interference fit were tested in maneuver loading programs with random loading sequence in order to investigate the effect of design load, lug material and interference fit on the spectrum fatigue life. An interference fit of 0.3% had a strong beneficial effect on the fatigue life for all loading programs, even when local tensile stress peaks exceeded the material yield stress. The spectrum fatigue life of 2024-T351 lug specimens was longer than that of 7075-T7351 specimens, except under the most severe loading program. Test results were compared with predictions based on the Miner's rule, the relative Miner rule, and the Neuber-Topper notch analysis method. The relative Miner rule was superior to the conventional rule in predicting the spectrum fatigue life of aircraft lugs; the Neuber-Topper notch analysis method was shown to have some application for the prediction of the effect of design load on the fatigue life of lugs with interference fit, but for the case of lugs without interference fit, predicted and test results disagreed completely. The disagreement is explained by the effect of fretting. J.F.

A82-11715 # **New separators for battery systems.** J. Lee and V. D'Agostino (RAI Research Corp., Hauppauge, NY). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 111-116.

The reported study takes into consideration separators for miniature cells, such as silver/zinc button cells, and separators for aircraft nickel/cadmium batteries. It is pointed out that separators for energy systems having an aqueous electrolyte, either acid or basic, can be prepared by selective modification of radiation grafting parameters. A new family of separators, known as the 'SC' series, has been developed. The SC separators have very uniform electrolytic resistance, excellent mechanical strength, and lower cost. General improvements in battery service life could be observed as a result of the introduction of the grafted seperators. The cycle life of vented aircraft Ni/Cd batteries could be extended three to four times. G.R.

A82-11716 # **Sealed lead-acid batteries for aircraft applications.** K. L. Senderak and A. W. Goodman (U.S. Navy, Naval Weapons Support Center, Crane, IN). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 117-122.

In the 1970's, an important advance in lead-acid battery technology occurred with the introduction of sealed, no-maintenance, lead-acid batteries. A description is given of a wide variety of studies and tests conducted to evaluate the suitability of the new batteries for employment in Navy aircraft. The results show that the sealed lead-acid (SLA) cells can be successfully used in a potentially large number of aircraft applications, where very high-rate discharge performance is not required. The Navy is actively pursuing the SLA battery for these applications to substantially reduce the Navy's overall battery procurement and maintenance costs, and to improve reliability. G.R.

A82-11717 # **Applications of finite element method in aerospace power systems design.** E. U. A. Siddiqui. In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 123-126.

Complex power systems are needed to satisfy the exacting power requirements of current avionic systems. A suitable tool for the design of such power systems is finite element analysis, based on the principle of minimization of total potential energy. This technique is being successfully used to eliminate excess weight and to accurately predict stresses and resonant frequencies. The new method was used to conduct an analysis in connection with a problem related to the occurrence of severe vibrations in a 30,000 rpm generator. The analysis had the objective to determine the effects of modifications made to the generator frame. It was found that the resonant frequency could be raised above the operational speed of the generator by introducing suitable modifications to the design of the frame. G.R.

A82-11718 # **Advanced aircraft electric power system.** J. D. Segrest (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 127-129.

The Advanced Aircraft Electric Power System is to increase fuel efficiency and reduce life cycle costs. The system includes 270 volt DC generators, solid state regulation, flat bus distribution, solid state switching, digital multiplex control and protection of power distribution through a system algorithm, and switching regulator power conditioning. A description is presented of the system concept, the hardware development, and the status of the Navy program. A high voltage DC power system development had been initiated by the Navy to exploit the advantages of high-voltage DC operation for future aircraft. G.R.

A82-11719 # **Variable speed constant frequency /VSCF/ electrical system cuts cost of ownership.** R. V. Hildebrant and R. C. VanNocker (General Electric Co., Aircraft Equipment Div., Binghamton, NY). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 130-135. 5 refs.

The methodology employed in the development of the electrical generating system for the F/A-18 aircraft is considered. This system was the first production application in which the cycloconverter electronics were packaged with the generator and mounted directly to the accessory gearbox. Being the first production system of this type, a detailed and comprehensive analysis and evaluation program was undertaken to provide assurance that the design could operate with a high degree of reliability in this generally hostile environment. A primary maintainability design objective was related to the design and the selection of parts and materials which would last for the life of the unit without scheduled maintenance. Attention is given to maintenance cost experience and life cycle costs. G.R.

A82-11720 # **A hidden advantage of permanent magnet electrical generating systems.** J. J. O'Neill (General Electric Co., Binghamton, NY). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 136-139. 7 refs. USAF-supported research.

The development of permanent magnet aircraft electrical generating systems heralds the beginning of a new era. This technique brings many advantages to the user in terms of size, weight and reliability. However, the most significant of these advantages is the extremely high efficiency which is characteristic of these systems. This paper examines the effect of the higher system efficiency on the user, specifically in the area of aircraft fuel consumption. Driven by rising fuel costs, engine and aircraft manufacturers are striving for more efficient performance to minimize life cycle costs. The results of a study which examines the effect of several permanent magnet ratings on different aircraft sizes are presented. (Author)

A82-11721 # **60 KVA ADP permanent magnet VSCF starter generator system - Generator system performance characteristics.** R. C. Webb (General Electric Co., Binghamton, NY). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 140-145. Contracts No. F33615-78-C-2200; No. F33615-74-C-2037.

A description is presented of a Variable Speed Constant Frequency (VSCF) system, which consists of a cycloconverter with a synchronous generator that uses samarium cobalt magnets for its excitation. As part of its normal operation, the converter regulates each output wave in frequency and in voltage providing the necessary voltage regulation for a permanent magnet (PM) generator. The cycloconverter is capable of reverse power flow and the PM generator has the necessary excitation at standstill to make it possible to run the system as a brushless starter. Attention is given to the phases of the development program, system operation, start mode operation, and test results. It is pointed out that the PM VSCF system offers a significant improvement in electrical generating system efficiency over presently used systems. G.R.

A82-11725 # **Unsolved problems of nickel cadmium batteries.** S. Gross (Boeing Aerospace Co., Seattle, WA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 177-181. 8 refs.

A number of problems occurring with nickel cadmium battery systems are primarily important for aerospace applications, where reliable, long life is essential. Some of the problems are related to the design of plaques to obtain a large capacity and a long operational life. Other subjects investigated are nickel electrode morphology changes, nickel electrode cycling degradation, and the effects of cadmium migration. It is found that more work is needed for a better understanding of the various factors involved. The development of a computerized mathematical model of the nickel cadmium cell is suggested. The effects produced by electrode additives are also discussed. G.R.

A82-11740 # **High voltage surge and partial discharge test to evaluate aerospace equipment parts.** W. G. Dunbar (Boeing Aerospace Co., Seattle, WA) and D. Schweickart (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 250-254.

Eight test articles were selected for high voltage evaluation to verify the specifications. The test articles represent critical components of a high-voltage, high-power airborne system. A description is presented of the findings of these tests in the case of the capacitors. Each capacitor was given preliminary tests to determine insulation resistance at 100 volts dc, and the capacity using a standard ASTM capacitance bridge at low voltage. It was found that the insulation resistance and capacitance test methods and parameters are acceptable. The partial discharge and dielectric withstanding voltage and surge test methods are acceptable, but the test parameters for airborne capacitors must be lower than those specified for commercial capacitors. G.R.

A82-11899 **Increasing the lift:drag ratio of a flat delta wing.** A. A. Mattick and J. L. Stollery (Cranfield Institute of Technology, Cranfield, Beds., England). *Aeronautical Journal*, vol. 85, Oct. 1981, p. 379-386.

Increases in the lift/drag (L/D) ratio attained by placing flaps on the upper surface of a flat, 60 deg, small aspect ratio delta wing are reported. The flaps were positioned along a ray from the vertex of the wing; their height, increasing from the vertex to the trailing edge, was a percentage of the semispan, and they were hinged at the lower edge. Position and heights were varied and lift and drag forces were measured over a range of angles of attack. The flaps were found to cause a lift force to act on themselves, up to a height of 6.1% of the semispan, by causing air from the primary vortex core to separate and form a vortex on the outboard side of the flaps. A maximum increase of 33% in the L/D was determined and it is noted that all the vertical flaps tested produced a positive thrust force. Graphs are provided of the derived aerodynamic ratios. M.S.K.

A82-11927 # **Fast and accurate gyrocompass using strapdown tuned rotor gyros as a solution to combat helicopters navigation problems.** P. Lloret, X. Lagarde, and G. Lavoipierre (Société d'Applications Générales d'Electricité et de Mécanique, Paris, France). In: Symposium Gyro Technology 1980; Proceedings of the Symposium, Stuttgart, West Germany, September 24, 25, 1980. Düsseldorf, Deutsche Gesellschaft für Ortung und Navigation, 1981, p. 1.0-1.25.

Results of verification tests to determine if gyrocompass mechanization can be used to find true headings within 0.5 deg in less than two minutes for helicopter navigation are presented. A strapdown inertial-Doppler navigation system which uses a pair of two-axis tuned rotor gyroscopes is described. The high accuracy of mechancial gyroscopes is attributed to the repeatability of the thermal behavior of tuned rotor gyroscopes. The gyros were temperature measured externally and in the instrument block, and correlations were sought between temperatures and drift patterns. Although true correlations were necessarily synthetic, drift rates of 15 deg/hr were reduced to 0.5 deg/hr peak residual drifts, confirming the potential use of 0.5 deg accuracy, two minute true heading mechanical gyroscopes as a complement to magnetic headings. M.S.K.

A82-11932 # **Design and development of a low cost servoed rate gyro for unmanned aircraft.** D. R. McKenzie (Smiths Industries Aerospace and Defence Systems Co., Cheltenham, Glos., England). In: Symposium Gyro Technology 1980; Proceedings of the Symposium, Stuttgart, West Germany, September 24, 25, 1980. Düsseldorf, Deutsche Gesellschaft für Ortung und Navigation, 1981, p. 14.0-14.56.

The development of a low cost rate gyro for use in unmanned vehicles is presented. The design parameters for the low weight gyro, which has an input range of plus or minus 50 deg/sec and can operate from a low voltage dc power source are outlined. A conventional design, comprising a spinning rotor on a gimbal with torque restraint and dynamic damping, was chosen to minimize cost and time; a feedback approach was adopted to maintain performance stability. A rotational speed of 10,000 rpm with a polar moment of inertia of 20 g/sq cm was selected. The pick-off, torque motor, servoamplifier, and plastic molding are discussed and performance figures for 25 gyros are presented. A pulsed motor circuit was developed to maintain motor speed within 7% of the set value over the operating temperature range; elimination of a wheel speed control improved nonlinearity and reduced costs. Circuitry diagrams and schematics are provided. M.S.K.

A82-11933 # **Design considerations for the direct digital control of dry-tuned gyroscope.** S. N. Puri (Indian Space Research Organization, Vikram Sarabhai Space Centre, Trivandrum, India). In: Symposium Gyro Technology 1980; Proceedings of the Symposium, Stuttgart, West Germany, September 24, 25, 1980. Düsseldorf, Deutsche Gesellschaft für Ortung und Navigation, 1981, p. 15.0-15.25.

The use of direct digital processor control of dry-tuned gyros is examined. Direct control is implemented because of a finite processing time lag between input and output, and is aided by minimizing the computation time by compensating for the effects of rounding coefficients in the control algorithm. The minimum settling time is discussed analytically and a design is developed that reduces complexity in the control function, offers lower torque demands, and has acceptably small steady state error. A retarded response is mentioned, and the use of a digital processor is found to add delays in the rebalance loops, requiring specific positioning of zeroes in the determinant of the pulse transfer function. An example is given, noting that pick-off noise at the spin frequency or its harmonics can be eliminated by use of a notch filter. Finally, a compromise is viewed as possible if slightly increased overshoot and settling time are found acceptable with a prescribed computing delay. M.S.K.

A82-11934 **Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980.** Symposium sponsored by the Royal Aeronautical Society and Institution of Electrical Engineers. London, Royal Aeronautical Society, 1981. 72 p.

Papers presented at the symposium provide an overview of the current status of digital avionic systems with emphasis on the practical experience in operating these systems, achievements and problems, and advanced technologies available. Topics discussed include: the influence of digital techniques on system architecture, certification of digital systems, the all digital military aircraft, and an airline's experience in the field. V.L.

A82-11937 # **The all digital military aircraft.** D. Roughton (British Aerospace Public, Ltd., Co., Brough, England). In: Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980. London, Royal Aeronautical Society, 1981. 14 p.

Developments in avionic systems over the past two decades are reviewed. The main factor that emerges is the conflict between the increasing complexity required to meet operational demands and the need for simplicity of operation to ease the workload of the reduced aircrew. In future aircraft, as the number and type of systems continue to grow, system integration and system automation are essential to ensure that the pilot workload is kept at an acceptable level. V.L.

A82-11938 # **The digital civil aircraft.** J. F. Moore (British Aerospace Public, Ltd., Co., Aircraft Group Div., Bristol, England). In: Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980. London, Royal Aeronautical Society, 1981. 16 p.

The development of digital avionics is reviewed with particular reference to application in civil aircraft. Examples of in-service systems in which digital technology has been already implemented are examined, including inertial navigation systems, aircraft integrated data systems/accident data recording, multiplexing systems, and the air intake control system of Concorde. Attention is given to the potential benefits of new applications, current developments, practical aspects, and implications of functional integration. Finally, future applications are discussed such as full digital engine control and flight controls (fly-by-wire system). V.L.

A82-11940 # **The certification of digital systems.** D. J. Hawkes (Civil Aviation Authority, London, England). In: Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980. London, Royal Aeronautical Society, 1981. 12 p. 9 refs.

The present situation in the field of airworthiness certification of digital systems is reviewed and the future certification task is examined with emphasis on safety-critical applications. It is shown that the existing certification requirements are adequate for the new generation of digital systems. For the foreseeable future, the certification task will be very similar to that currently undertaken and will involve performance verification, environmental testing, and safety analyses. The certification task will be refined and judgement will be improved as the weaknesses and peculiarities of digital systems are exposed. V.L.

A82-11941 # **Digital avionics systems - The RAF experience.** B. J. Hunter (RAF, London, England). In: Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980. London, Royal Aeronautical Society, 1981. 6 p.

The RAF's practical experience in operating digital avionic systems is reviewed with reference to a computer-based navigation and attack system that forms part of a pilot/aircraft control loop for navigation, weapon aiming, and flight direction installed on Jaguar aircraft. The system has proved to be flexible and reliable; modifications of the system can now be accomplished by a software, rather than hardware, change; and the first and second line testing has been reduced. The software maintenance practice and management are discussed in detail. V.L.

A82-11942 # **Digital avionics: Promise and practice - An airlines experience in the field.** J. E. Mills (British Airways, Hounslow, Middx., England). In: Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980. London, Royal Aeronautical Society, 1981. 4 p.

The British Airways experience with digital avionic systems is reviewed with regard to the initial expectations, achievements, and maintenance and engineering problems encountered. It is shown that the introduction of digital systems into civil aviation did not produce the promised increase in reliability, the self test results being particularly disappointing. However, no maintenance problems of any great significance have been encountered. It is expected that the use of custom LSI and microprocessors will diminish problems previously associated with hardware and will provide improved reliability and more competent self test and monitoring, leading to improved first line servicing. V.L.

A82-11987 # **The CIVIC - A concept in vortex induced combustion. II.** J. R. Shekleton (Solar Turbines International, Turbomach Div., San Diego, CA). *(American Society of Mechanical Engineers, International Gas Turbine Conference, Houston, TX, Mar. 8-12, 1981, Paper 81-GT-12.) ASME Transactions, Journal of Engineering for Power*, vol. 103, Oct. 1981, p. 708-717. 34 refs.

The development of vortex induced combustion is reviewed, noting that the modelling is based on convective processes in unequally heated adjacent air masses. The aerodynamics of vortex flow are analytically examined, and reaction criteria in gas turbine and reciprocating engine vortex combustors are presented. Buoyant mixing to achieve fast, near constant volume combustion in diesel engines is described for two cases. Use of a rotating cup fuel injector in a 10 kW gas turbine to provide good atomization with viscous fluids, even in arctic conditions, is discussed, including a new design feature which avoids injecting the fuel mist into the swirl air. Test results and schematics are presented of various applications, stressing the ability of vortex induced combustion to display efficiencies with standard liquid fuels usually obtained only with natural gas. M.S.K.

A82-11990 * # **Thermal expansion accommodation in a jet engine frame.** M. H. Schneider (General Electric Co., Cincinnati, OH). *(American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, Houston, TX, Mar. 9-12, 1981.) ASME Transactions, Journal of Engineering for Power*, vol. 103, Oct. 1981, p. 778-780. Contract No. NAS3-20643.

Design advancements to enhance stress accommodation in gas turbine engine frames are described. Consideration is given to mechanical stiffness to maintain an adequate spring rate, and to thermal stresses in both ambient and transient modes. Noting that thermal stresses occur due to differing temperatures at different parts of the frame, the matching of the thermal expansion rates of different structural materials is emphasized. Adequate stiffness is necessary to avoid dynamic reactions leading to case cracking as a result of normal imbalances of moving parts. Stress and deflection analysis of a total frame concept using a three-dimensional finite element stress analysis computer program, with modelling of all frame components, is presented, and illustrations are provided.
M.S.K.

A82-12021 † **Jet fuel from carbon (Reaktivnoe toplivo iz uglia).** A. A. Krichko, M. K. Iulin, A. C. Arifulin, T. C. Nikiforova, and V. A. Puchkov (Akademiia Nauk SSSR, Institut Goriuchikh Iskopaemykh, Moscow, USSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 9, 1981, p. 3-5. 8 refs. In Russian.

A jet fuel of the T-8V type has been obtained by isomerization and hydrogenation at 4 MPa of the hydrorefined 180-320 C fraction of a liquid-phase carbon hydrogenation product. The flow scheme and the material balance of the process are presented. V.L.

A82-12022 † **A protective additive for jet fuels (Zashchitnaia prisadka k reaktivnym toplivam).** O. P. Lykov, G. I. Shor, V. P. Lapin, V. V. Sashevskii, and L. I. Mosina (Moskovskii Institut Neftekhimicheskoi i Gazovoi Promyshlennosti, Moscow, USSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 10, 1981, p. 37-40. 6 refs. In Russian.

A study has been carried out to investigate the protective action of an additive to jet fuels which consists of a mixture of dimers and trimers of synthetic fat acids. Results indicate that there exists a correlation between changes in the protective properties of the fuel as a function of the additive content, on the one hand, and changes in certain electrophysical characteristics of the fuel (e.g., conductivity, contact potential difference change, and electrifiability), on the other hand. V.L.

A82-12025 * **Design predictions for noise control in the cryogenic National Transonic Facility.** W. S. Lassiter (NASA, Langley Research Center, Hampton, VA). *Noise Control Engineering,* vol. 17, Sept.-Oct. 1981, p. 76-84. 6 refs.

Noise control in the National Transonic Facility - a cryogenic wind tunnel - has been examined in terms of acoustical design criteria, drive-fan noise and exhaust system noise. A duct lining with two layers of perforated sheeting and a gas-filled honeycomb core was selected for attenuating drive-fan noise. With the exception of attenuation peaks, attenuation of the lining was found to experimentally agree with predicted values at 20 C air temperatures. Exhaust system noise will be attenuated with a large muffler used in conjunction with a 6.1-m high acoustical enclosure. Fan noise from the fan-ejector system will be attenuated by fan silencers and the acoustic enclosure. S.C.S.

A82-12026 **Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980.** Conference sponsored by the American Society of Mechanical Engineers. Edited by J. R. Vinson (Delaware, University, Newark, DE). New York, American Society of Mechanical Engineers, 1980. 333 p. $20.

Topics discussed include the emerging technologies in composite materials structures, in materials, and in structural dynamics, shock and impact. Particular attention is given to impact-initiated damage thresholds, adhesively bonded joints in composites, stress concentrations in bonded multilayer stiffened strips and base plates, and the fatigue life of coldworked holes. Consideration is also given to the response of nonlinear aircraft structural panels to high intensity noise, the dynamic numerical analysis of crack initiation, fast crack propagation and crack arrest, and the energy release rate of a penny-shaped crack at the fiber-end of a composite. J.F.

A82-12028 * # **Impact-initiated damage thresholds in composites.** A. V. Sharma (North Carolina Agricultural and Technical State University, Greensboro, NC). In: Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980. New York, American Society of Mechanical Engineers, 1980, p. 11-26. 10 refs. Grant No. NsG-1296.

An experimental investigation was conducted to study the effect of low velocity projectile impact on the sandwich-type structural components. The materials used in the fabrication of the impact surface were graphite-, Kevlar-, and boron-fibers with appropriate epoxy matrices. The testing of the specimens was performed at moderately low- and high-temperatures as well as at room temperature to assess the impact-initiated strength degradation of the laminates. Eleven laminates with different stacking sequences, orientations, and thicknesses were tested. The low energy projectile impact is considered to simulate the damage caused by runway debris, dropping of the hand tools during servicing, etc., on the secondary aircraft structures fabricated with the composite materials. The results show the preload and the impact energy combinations necessary to cause catastrophic failures in the laminates tested. A set of faired curves indicating the failure thresholds is shown separately for the tension- and compression-loaded laminates. The specific-strengths and -moduli for the various laminates tested are also given.
(Author)

A82-12039 # **Coupled fluid/structure response predictions for soft body impact of airfoil configurations.** J. J. Engblom (United Technologies Corp., Government Products Div., West Palm Beach, FL). In: Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980. New York, American Society of Mechanical Engineers, 1980, p. 209-223. 8 refs. Research supported by the United Technologies Corp.

Jet engine overhaul costs related to foreign object damages (FOD) are a significant concern in aircraft operations. Present FOD design systems, however, are not applicable to advanced airfoil configurations. An analytical design tool has therefore been developed to improve the FOD response prediction capability for the soft body impact of metal or composite fan blades, and is implemented by a finite element computer code. The basic approach involves coupling a fluid loading model with a structural model for the blade. Iterative effects are included in the solution, i.e., applied loads are a function of the structural response. Solutions include the effects of large displacement (geometric) and material (inelastic) nonlinearities. The code is also modified to treat the response of hybrid composite materials, demonstrating its capability to meet impact response predictions for complex metal or composite airfoil configurations. It is concluded that the analysis can be used to support the design of future high tip speed FOD-tolerant fan blades. J.F.

A82-12041 # **Response of nonlinear aircraft structural panels to high intensity noise.** C. Mei (Old Dominion University, Norfolk, VA). In: Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980. New York, American Society of Mechanical Engineers, 1980, p. 245-272. 17 refs. Contract No. F49620-79-C-0169.

Design methods and design criteria for sonic fatigue prevention have been developed based on analytical and experimental techniques. This paper presents an analytical method for predicting the response of rectangular nonlinear structural panels subjected to broadband random acoustic excitation. The formulation is based on the Karman-Herrmann large deflection plate equations, a single-mode Galerkin approximation, the equivalent linearization method, and an iterative procedure. Both simply-supported and clamped-support conditions with immovable or movable inplane edges are considered. Panel mean-square deflection, maximum mean-square stress, and equivalent linear frequency at various acoustic loadings are determined and presented in graphical form. The results obtained were shown to agree well with experimental ones, and suggestions for further research are given. J.F.

A82-12043 # **Crack growth evaluation of a method to convert real-time loads history to a simplified engineering spectra.** E. J. Ferko (Lockheed-Georgia Co., Marietta, GA). In: Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980. New York, American Society of Mechanical Engineers, 1980, p. 285-294. 6 refs.

The random and independent nature of shear and axial stresses due to gust sources poses a complex problem for the structural analysis of cracks emanating from fastener holes in spanwise and beam-web splices of a transport aircraft wing. A practical engineering solution to the shear/axial stress interaction problem was developed for the C-5A wing, and a box beam test program was conducted to evaluate the solution. The evaluation was accomplished by comparing crack propagation rates generated by testing flight measured real time histories (RTH) with the engineering solution (referred to as the Equivalent Analytical Representation spectra). The baseline RTH spectra consisted of loads data recorded during dynamic response flight testing. The EAR spectra was derived from the aforementioned RTH data and was analytically developed utilizing peak counting methods and the empirical shear/axial stress interaction solution. Fractographic correlation of numerous cracks indicated that the EAR spectra adequately simulated the random nature of shear and axial stresses in the RTH data. (Author)

A82-12045 # **Numerical treatment of helicopter rotor stability problems.** R. Vepa and T. S. Balasubramanian (National Aeronautical Laboratory, Bangalore, India). In: Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980. New York, American Society of Mechanical Engineers, 1980, p. 307-319. 14 refs. Research supported by the Ministry of Defence.

The problem of calculating the Floquet transition matrix for parametric stability problems is considered. A new method of calculating the transition matrix with a minimum number of time steps is described. The method is shown to be extremely efficient for a wide class of helicopter stability problems, including flapping stability of a helicopter rotor, helicopter ground resonance with a nonisotropic rotor and pitch-flap-bending stability of a helicopter rotor in forward flight. The relationship of the method to the classical method of averaging is pointed out. (Author)

A82-12046 **ACMA - Fact or fantasy.** W. T. Mikolowsky and W. A. Garrett (Lockheed-Georgia Co., Marietta, GA). *Lockheed Horizons,* Fall 1981, p. 2-12.

The feasibility of the advanced civilian/military aircraft (ACMA) for use as both an advanced military airlift vehicle and a commercial airfreighter is discussed. A partnership in development between government and industry is expressed as necessary to reduce costs through larger production quantities, to increase emergency airlift capabilities in the Civil Reserve Air Fleet, and commercial maintenance of military aircraft. Design options and requirements are presented along with timetables, showing production delivery to commence in 1994. Topics such as commercial need, energy use, engine design, and financial planning are examined, with emphasis on system features that enhance the commercial attractiveness of the vehicle. A preliminary configuration shows a payload capability of 390,000 lbs with a fuel efficiency 50% better than that of the 747-200F. M.S.K.

A82-12049 **History of flight testing the L-1011 TriStar jet transport. II - Testing highlights since initial certification of the L-1011-1.** R. J. Gatineau (Lockheed-California Co., Palmdale, CA). *Lockheed Horizons,* Fall 1981, p. 14-29.

A82-12087 # **Considerations and applications for the use of fluidics in aerospace controls.** T. G. Sutton (AiResearch Manufacturing Company of Arizona, Phoenix, AZ). In: 20th Anniversary of Fluidics Symposium, Chicago, IL, November 16-21, 1980, Proceedings. New York, American Society of Mechanical Engineers, 1980, p. 73-79. 6 refs.

Fluidics technology has been considered for use in controls in aerospace environments in order to obtain reliable and cost-effective systems. While many applications involving fluidics have been in production for several years, there have been a number of failures while attempting to apply fluidics technology to aerospace applications. Because of this, fluidic techniques must be very carefully evaluated for any application before being considered as the most desirable technology to be used. An overview is given of design parameters which must be given due consideration by the fluidic system designer. Included are the interfacing of the technology with other system components. Case histories of three fluidic control applications are cited. C.R.

A82-12100 **Quantification of the thermal environment for externally carried aircraft stores and ordnance.** H. Schafer and I. Barbe (U.S. Naval Weapons Center, China Lake, CA). *Journal of Environmental Sciences,* vol. 24, Sept.-Oct. 1981, p. 23-28.

Thermal testing procedures for aircraft external stores and ordnance are discussed, noting the importance of considering the entire range of possible thermal environments for each tested component. A method is proposed in which necessary parameters of environmental variables such as aircraft speed, altitude, air temperature, and amount of fuel available are considered in terms of percentiles. A Gaussian distribution is assumed for each environmental range, enabling for example, the elimination of extreme high and low flight speeds from average environment estimates. Use of the Arnold Research and Development Center standard atmosphere was found to be preferrable for engineering considerations because of inherent biasing errors in the MIL-STD-210 hot and cold data atmosphere. Techniques of cross-correlating environmental percentiles are defined, and it is emphasized that thermal gradients cause the greatest hardware performance degradation. M.S.K.

A82-12107 # **The dispersion of drop sizes in gas turbine fuel nozzle sprays.** D. L. Markham (Ex-Cell-O Corp., Walled Lake, MI). In: Fluid mechanics of combustion systems; Proceedings of the Fluids Engineering Conference, Boulder, CO, June 22, 23, 1981. New York, American Society of Mechanical Engineers, 1981, p. 95-100. 6 refs.

The dispersion of drop sizes in sprays as produced by gas turbine fuel nozzles was studied by conducting a large number of tests on several fuel nozzle sprays using a Malvern ST1800 Particle and Droplet Size Distribution Analyzer. It is found that the size dispersion of a spray depends on the location where the spray cloud is sampled, nozzle type, and nozzle operating condition. It is concluded that to fully specify the drop size characteristics of a gas turbine fuel nozzle spray, not only must the mean drop size of the drop size distribution be reported, but also the drop size dispersion. P.T.H.

A82-12118 # **Application of numerical modeling to gas turbine combustor development problems.** G. J. Sturgess, S. A. Syed, and D. Sepulveda (United Technologies Corp., Commercial Products Div., East Hartford, CT). In: Fluid mechanics of combustion systems; Proceedings of the Fluids Engineering Conference, Boulder, CO, June 22, 23, 1981. New York, American Society of Mechanical Engineers, 1981, p. 24[illegible]-250. 23 refs.

The effects of dome cooling air changes in an experimental combustor for a large, turbofan gas turbine engine are investigated by means of perturbation studies carried out with numerical modeling. Two geometrical configurations are examined at high engine power levels, and calculated changes in the flow fields are compared with evidence obtained from experimental engines. Changes in dome and liner pressure drops are observed with severe dome distress in one of the configurations. It is concluded that the combustor simulations are qualitatively correct and have satisfactory quantitative agreement without requiring exact geometrical representations. D.L.G.

A82-12120 * # **On the prediction of swirling flowfields found in axisymmetric combustor geometries.** D. L. Rhode, D. G. Lilley, and D. K. McLaughlin (Oklahoma State University, Stillwater, OK). In: Fluid mechanics of combustion systems; Proceedings of the Fluids Engineering Conference, Boulder, CO, June 22, 23, 1981. New York, American Society of Mechanical Engineers, 1981, p. 257-266. 32 refs. Grant No. NAG3-74.

The paper reports research restricted to steady turbulence flow in axisymmetric geometries under low speed and nonreacting conditions. Numerical computations are performed for a basic two-dimensional axisymmetrical flow field similar to that found in a conventional gas turbine combustor. Calculations include a stairstep boundary representation of the expansion flow, a conventional k-epsilon turbulence model and realistic accomodation of swirl effects. A preliminary evaluation of the accuracy of computed flowfields is accomplished by comparisons with flow visualizations using neutrally-buoyant helium-filled soap bubbles as tracer particles.

Comparisons of calculated results show good agreement, and it is found that a problem in swirling flows is the accuracy with which the sizes and shapes of the recirculation zones may be predicted, which may be attributed to the quality of the turbulence model. D.L.G.

A82-12149 **Determination of vertical profiles of aerosol size spectra from aircraft radiative flux measurements. II - The effect of particle nonsphericity.** R. M. Welch (Mainz, Universität, Mainz, West Germany), S. K. Cox (Colorado State University, Fort Collins, CO), and K. Ia. Kondrat'ev (Glavnaia Geofizicheskaia Observatoriia, Leningrad, USSR). *Journal of Geophysical Research,* vol. 86, Oct. 20, 1981, p. 9795-9800. 28 refs. NSF Grants No. ATM-78-05743; No. ATM-77-22384.

A82-12170 † **Control of electromechanical actuator elements for flight vehicles (Upravlenie ispolnitel'nymi elementami slediashchikh elektroprivodov letatel'nykh apparatov).** B. I. Petrov, V. V. Bal'bukh, N. P. Pappe, V. P. Pappe, V. A. Serdiuk, and V. G. Stebletsov. Moscow, Izdatel'stvo Mashinostroenie, 1981. 222 p. 40 refs. In Russian.

The control theory of electromechanical actuator elements is developed with particular reference to application in electrical flight control systems (e.g., for tactical missiles). Attention is given to the use of ac motors and dc motors in such systems, and to digital actuator systems. The limiting dynamic possibilities and energetic characteristics of electromechanical actuators are considered. B.J.

A82-12222 † **The enhancement of heat exchange in channels /2nd revised and enlarged edition/ (Intensifikatsiia teploobmena v kanalakh /2nd revised and enlarged edition/).** E. K. Kalinin, G. A. Dreitser, and S. A. Iarkho. Moscow, Izdatel'stvo Mashinostroenie, 1981. 208 p. 199 refs. In Russian.

An analysis is presented of various means for the enhancement of heat exchange in the heat exchange channels of flight vehicles. The factors governing the selection of heat exchange enhancement method are considered, and specific methods applicable to right channels and longitudinal flow around a bundle of tubes, and curved channels are indicated. Attention is then given to the methods and mechanisms of heat exchange enhancement in pipes, around pipe bundles and in circular channels, in two-dimensional and triangular channels, taking into account the effects of hydraulic resistance and the effectiveness of the various methods is evaluated. The enhancement of heat exchange in the presence of film boiling on the one hand and condensation on the other in channels is also examined. A.L.W.

A82-12267 # **Validation studies of turbulence and combustion models for aircraft gas turbine combustors.** S. A. Syed and G. J. Sturgess (United Technologies Corp., Commercial Products Div., East Hartford, CT). In: Momentum and heat transfer processes in recirculating flows; Proceedings of the Winter Annual Meeting, Chicago, IL, November 16-21, 1980. New York, American Society of Mechanical Engineers, 1980, p. 71-89. 29 refs.

The paper describes work performed as part of a continuing program to explore computational fluid dynamics procedures and related turbulence and combustion models for application to the design, understanding, and development of aircraft gas turbine combustors. Validation studies were conducted using a finite difference procedure (TEACH) to solve the relevant steady, two-dimensional, elliptic transport equations for turbulent flow. The familiar two equation (k-epsilon) turbulence model was used. The combustion model was based on the dissipation rate of oxidant, fuel, and product containing eddies. It was concluded that for confined, nonreacting flows with reasonably well defined boundary conditions, the turbulence model predicts mean flow quantities to an accuracy of about 85 percent in regions of parabolic flow. The size of the recirculation zone is underpredicted by about 15-20 percent, and its strength is underpredicted by 20-25 percent. (Author)

A82-12318 **Extending the limits of reliability theory.** H. Goldberg. New York, Wiley-Interscience, 1981. 275 p. 15 refs. $32.50.

Aspects of probability and statistics are examined, taking into account the objective view of probability, the binomial distribution, the use of probability for prediction, the meaning of the reliability (survivor) function, questions of discrete and continuous distribution, time-to-failure distributions, and distributions found in the reliability literature. Attention is given to the determination of the time-to-failure distribution of a component, the sources of component failure data, the real world of electronic component procurement, the time to first failure for new systems, and system survivor functions for certain component distributions. Redundancy and survivor functions of systems are considered along with questions related to renewal theory and mean time between failures, a Monte Carlo investigation of systems based on normal distributions, and subjects related to precision, confidence, and numbers tested. G.R.

A82-12323 **Antenna theory and design.** W. L. Stutzman (Virginia Polytechnic Institute and State University, Blacksburg, VA) and G. A. Thiele (Dayton, University, Dayton, OH). New York, John Wiley and Sons, 1981. 608 p. 158 refs. $30.95.

Antenna fundamentals and definitions are examined, taking into account electromagnetic fundamentals, the solution of Maxwell's equations for radiation problems, the ideal dipole, the radiation pattern, directivity and gain, reciprocity and antenna pattern measurements, antenna impedance and radiation efficiency, antenna polarization, antennas in communication links and radar, and the receiving properties of antennas. Some simple radiating systems are considered along with arrays, line sources, wire antennas, broadband antennas, moment methods, and aperture antennas. High-frequency methods and aspects of antenna synthesis are discussed, giving attention to geometrical optics, physical optics, wedge diffraction theory, the ray-fixed coordinate system, the cylindrical parabolic antenna, and linear array methods. G.R.

A82-12449 **Commercial EMS considerations for small gas turbine engines.** R. Halliday (Pratt and Whitney of Canada, Ltd., Longueuil, Quebec, Canada). In: Aircraft gas turbine engine monitoring systems; Proceedings of the Aerospace Congress and Exposition, Los Angeles, CA, October 13-16, 1980. Congress and Exposition sponsored by the Society of Automotive Engineers. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 23-26.

It is shown that electronic automated engine monitoring systems (EMS) offer advantages over manual methods for power assurance, trend and limit exceedance monitoring, and low cycle fatigue and creep life recording. System cost, which is the main constraint on EMS for small gas turbines, is proportional to the number of parameters measured. Although EMS cost may preclude a full diagnostic capability, it may be reduced by 'piggy backing' with other systems, such as those for fuel control or flight monitoring. Future EMS are predicted to be part of modular, fully integrated systems employing multiplexing techniques. It is concluded that ARP 1587 is needed for that level of integration to be achieved. Among the parameters monitored by an EMS are turbine temperature, gas generator speed, free turbine speed, output torque, pressure altitude, and outside air temperature. O.C.

A82-12450 **Further application and development of an engine usage/life monitoring system for military services.** R. Holl. In: Aircraft gas turbine engine monitoring systems; Proceedings of the Aerospace Congress and Exposition, Los Angeles, CA, October 13-16, 1980. Congress and Exposition sponsored by the Society of Automotive Engineers. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 27-30.

The Engine Usage Monitoring System (EUMS) which determines the rate and extent to which major and critical components of military engines are being consumed. Rapid development and limited funding constraints led to the production of the Mk I EUMS, which incorporates a Phillips-type magnetic tape cassette as the recording medium and serial digital data formatting and has shown good performance point recording accuracy and reliability. The Mk II development of the EUMS incorporates a microprocessor, a solid state memory, and associated large scale electronics miniaturization and integration. With the addition of a visual display unit, onboard computing/display facility requirements are also satisfied. A civil aviation application of the EUMS is projected on the strength of its basic simplicity and low cost. O.C.

A82-12486 **Powder metallurgy superalloys - Aerospace materials for the 1980's; Proceedings of the Conference, Zurich, Switzerland, November 18-20, 1980. Volume 1.** Shrewsbury, Salop, England, MPR Publishing Services, Ltd., 1980. 237 p.

The conference focused on the latest advances in the powder metallurgy of superalloys, including developments in powder production, consolidation, and shape-making techniques, and applications. Papers are presented on the novel aspects for high-quality metal powder production equipment, oxide dispersion strengthened materials by mechanical alloying, potential for PM superalloys in aero engine application, HIP systems for superalloys, and electron-beam welding of PM nickel-base superalloys. V.L.

A82-12496 **Superclean superalloy powders by the rotating electrode process.** P. Loewenstein (Nuclear Metals, Inc., Concord, MA). In: Powder metallurgy superalloys - Aerospace materials for the 1980's; Proceedings of the Conference, Zurich, Switzerland, November 18-20, 1980. Volume 1. Shrewsbury, Salop, England, MPR Publishing Services, Ltd., 1980, p. 7, 7-1 to 7-28. 18 refs.

A REP (rotating electrode process) powder system with inert gas handling has been developed for the manufacture of 'superclean' superalloy powders for fatigue-critical turbine applications. The system employs a noncontaminating plasma arc source and input electrodes in the form of precision ground bars that are free from nonmetallic inclusions. The production capability of the superalloy powder facility is approximately 500,000 kg per year. V.L.

A82-12497 **Superalloy turbine components - Which is the superior manufacturing process, as-HIP, HIP plus Isoforge, or 'gatorizing' of extrusion consolidated billet.** J. Coyne, W. H. Couts, C. Chen, and R. P. Roehm (Wyman-Gordon Co., North Grafton and Worcester, MA). In: Powder metallurgy superalloys - Aerospace materials for the 1980's; Proceedings of the Conference, Zurich, Switzerland, November 18-20, 1980. Volume 1.
Shrewsbury, Salop, England, MPR Publishing Services, Ltd., 1980, p. 11, 11-1 to 11-31.

Identical parts of superalloys IN-100, René 95, MERL-76, AF-115, and Astroloy, which are being considered for turbine engine applications, have been produced by three different powder metallurgy techniques: as-HIP, HIP plus Isoforge, and gatorizing of extrusion-consolidated billet. The mechanical properties of parts produced by the different processes are found to be equivalent. Thus, the choice of a process should be based on factors other than the currently expected mechanical properties; namely, materials utilization, inspectability, and economics. V.L.

A82-12498 **Superalloy powder engine components; controls employed to assure high quality hardware.** J. E. Coyne, W. H. Everett, and S. C. Jain (Wyman-Gordon Co., North Grafton and Worcester, MA). In: Powder metallurgy superalloys - Aerospace materials for the 1980's; Proceedings of the Conference, Zurich, Switzerland, November 18-20, 1980. Volume 1.
Shrewsbury, Salop, England, MPR Publishing Services, Ltd., 1980, p. 24, 24-1 to 24-27.

A program involving the production of several hundred turbine engine components from René 95 alloy is reviewed. Consideration is given to powder transportation and handling, development of stock acceptance tests and quality assurance program, precautions taken to avoid powder contamination in the process of handling prior to HIP'ing, and final testing. Examples of crack initiating defects and their effect on mechanical properties are included. V.L.

A82-12560 # **Lineup of the IM-series aircraft-derivative gas turbines.** *Ishikawajima-Harima Engineering Review*, vol. 21, July 1981, p. 279-285. 13 refs. In Japanese, with abstract in English.

In order to establish the reliability of the power turbines to be developed by IHI, extensive investigations are carried out, in particular, on the rotor assemblies. With engine test runs using actual IM5000 gas turbines, confirmation of the power turbine blade vibratory stress is carried out through the whole operating range. The measured stress levels reveal that they are far below the critical limits and that no detrimental resonance is to be expected. The same procedure is used with the IM2500 power turbine. In addition to analyses of the rotating parts, the various stationary parts are tested, especially the transient behavior of the casing for quick thermal response at the time of starting, stopping and emergency shutdown of the engine. C.R.

A82-12583 **Fuel conservation - DC-9 series 20/30/40.** *Society of Flight Test Engineers, Journal*, vol. 3, Sept. 1981, p. 2-17.

Operational performance penalties and approximate fuel costs associated with the aerodynamics, flight operations, fuel gage system and performance analysis aspects of the DC-9 Series 20, 30 and 40 aircraft are presented. Degradations in aerodynamic cleanness, caused by the gradual deterioration of various seals, rigging adjustments and skin surface smoothness, are shown to lead to drag increases of less than 0.5%, which, however, represents a significant cost in view of the amount of fuel consumed. Flying off-optimum altitude or Mach number may result in excess fuel expenditures greater than those due to degraded aerodynamic cleanness. Other operational factors with substantial influence on fuel use include fuel or aircraft weight, center of gravity, flight time, the use of automatic flight control systems, APU operation, engine starting times, takeoff procedures, climb speed, en route profile, descent profile, and approach maneuvers. The DC-9 fuel gage system has been designed to be as accurate as possible in all phases, in order to minimize the necessity of carrying excess fuel for a given flight. Finally, investigations of aircraft performance may be used to identify areas requiring correction through the comparison of the indicated performance level against a reference, the assessment of engine and airframe contributions, and the investigation of the most likely areas for correction - the external control surfaces and internal systems. S.C.S.

A82-12584 **Procedures and analysis techniques for determining static air minimum control speeds.** E. N. Bradfield (USAF, Flight Test Center, Edwards AFB, CA). *Society of Flight Test Engineers, Journal*, vol. 3, Sept. 1981, p. 18-48. 6 refs.

A method is presented which can be used to establish the minimum air speed required for the static lateral and directional control of a multiengined aircraft following the failure of one or more engines. Equations for the thrust moment and rudder pedal force coefficient in an asymmetrical force condition are derived from minimum directional control speed theory, and applied to the analysis of data obtained in climbs of the B-57 aircraft through a significant altitude band at minimum directional control speed with wings level and banked at various angles, and with a rudder power assist system both operational and inoperative. An analysis procedure is also presented for aircraft for which minimum control is defined by the lack of lateral, rather than directional control, such as STOL and powered-lift aircraft. These methods allow minimum control speed testing to be accomplished safely, without the necessity of flying at extreme low altitudes with an engine shut down, and permit extrapolation to off-standard-day conditions and various gross weights. S.C.S.

A82-12626 **National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings.** Meeting sponsored by the Institute of Navigation. Washington, DC, Institute of Navigation, 1981. 190 p.

Papers are presented on such topics as all-digital GPS receiver mechanization, worldwide coverage of the Phase II Navstar satellite constellation, real-time missile tracking with GPS, navigation task partitioning in distributed-processing avionics systems, and memory requirements for future aerospace navigation systems. Consideration is also given to the simulation study of a hybrid strapdown attitude and heading reference system, a comparative study of strapdown algorithms, ring laser gyro navigator flight test results, and size effects in strapdown navigators. P.T.H.

A82-12630 # **Satellite geometry considerations for low cost GPS user equipment.** Y. Rosenthal (Intermetrics, Inc., Cambridge, MA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 30-32. FAA-supported research.

The paper evaluates the geometrical properties of various GPS satellite configurations as seen by a low-cost user equipment designed for use by general aviation (GA). The GA user is equipped with one antenna which covers an 85-deg cone perpendicular to the plane of the aircraft. Therefore, when the aircraft banks, satellites which are above the horizon may be shadowed. Through a nominal turn at a bank angle of 25 deg, the identity of the visible satellites is changing rapidly. Hence, preselection of the best four satellites is impossible. Criteria for comparing 24 satellites from the GA user point of view is presented, as well as some preliminary results which indicate the different results provided by different constellations. Results show that as far as GA is concerned, the coverage provided by various 24 satellite constellations is not of equal value. P.T.H.

A82-12634 # **A solution to the static geometry problem for JTIDS relative navigation.** R. Weiss (Intermetrics, Inc., Cambridge, MA) and P. Asher (USAF, Joint Program Office, Bedford, MA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 62-64.

The current JTIDS (Joint Technical Information Distribution System) relative navigation algorithm restricts the use of relative position data in order to maintain stability. In a static geometry situation, the position quality will be degraded. This paper proposes a solution to the static geometry problem which involves a second source that maintains a high position quality by constraining its covariance matrix. There are several ways to implement this situation, each of which must be evaluated in a simulation environment for scenarios involving transitions from static geometry to normal mode. P.T.H.

A82-12636 # **Hard limited approaches to correlation velocity sensing.** T. J. Lund, R. E. Chapman, and G. A. Murdock (Teledyne, Inc., Teledyne Ryan Electronics, San Diego, CA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 79-83. 6 refs.

Correlation velocity sensors determine velocity by measuring the time delay required for best correlation between signals gathered by two downward looking radar receiver antennas having known separation along the velocity axis being measured. This paper discusses a variation of this basic technique in which the received signals are hard limited such that correlation is only performed on the phase of the signal. The hard limiting approach avoids the need for AGC and allows the receiver outputs to be applied directly to a digital processor. Comparisons of correlation functions are presented for linear correlations on the total signal (phase and amplitude), amplitude only and phase only. It is shown that the correlation properties of hard limited signals are well suited to correlation velocity sensing. The results of simulations of the correlation velocity sensing process, which included a realistic terrain scattering model, are presented for various flight conditions and terrain types. The implementation of a hard limited correlation velocity sensor is discussed. (Author)

A82-12637 # **Memory requirements for future navigation systems.** R. Fedorak (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA) and B. A. Zempolich (U.S. Navy, Naval Air Systems Command, Washington, DC). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 84-89.

The paper examines current problems concerning memories used in aerospace navigation systems, identifies technical management concerns relative to various aspects of current use of specific memory technologies, and discusses memory requirements for future aerospace navigation systems. Particular attention is given to such aspects as nonvolatility, electrical reprogrammable memories, commonality of memory hardware between platforms, packaging, and memory capacity. MNOS EEPROM, MNOS 8K BORAM, MNOS EAROM, and bubble memories are considered. P.T.H.

A82-12638 # **Omega station 10.2 kHz signal selection made easy.** R. R. Gupta and R. S. Warren (Analytic Sciences Corp., Reading, MA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 90-103. 7 refs.

Recently developed Omega station signal coverage prediction diagrams for 10.2 kHz at eight representative diurnal and seasonal global times of the year provide the most complete presentation of Omega station signal coverage ever available to Omega users. This paper presents minimum and maximum coverage extremes characterized by the coverage diagrams for the eight representative coverage times of the year for two signal selection criteria. A simplified algorithm which yields a conservative determination of the coverage is obtained by using the maximum coverage boundary. The range and bearing coordinates of minimum and maximum SNR boundaries for -20 dB and -30 dB are provided in tabular form for each Omega station. P.T.H.

A82-12639 # **FAA acceptance tests on the NAVSTAR GPS Z-Set receiver.** R. J. Esposito (FAA, Technical Center, Atlantic City, NJ). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 104-107.

This paper describes FAA acceptance tests on the NAVSTAR GPS Z-Set receiver which were conducted in a USAF System Command C-141 aircraft over the instrumented range located at the Yuma Proving Ground. The Yuma laser tracking system computed a reference trajectory against which the GPS receiver solution was compared. Data from five flights, totalling over six hours, are presented with the objective of assessing Z-Set capabilities to meet civil aviation requirements for non-precision approaches. (Author)

A82-12640 # **A navigation systems planning model.** H. L. Solomon and A. R. Stephenson (Systems Control, Inc., Palo Alto, CA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 108-119.

The advent of Navstar/GPS has directed the attention of government decision-makers to the possibility of ultimately replacing or supplementing existing navigation systems with one or more alternative systems. To assist these decision-makers in evaluating these and other navigation policy alternatives, a navigation system cost/benefit model is being developed. A comprehensive data base is also being developed from which the appropriate information can be extracted by the model in response to navigation system implementation/decommissioning scenarios, as defined by the model users. The model will predict the user's annualized response to a stipulated scenario in terms of receiver purchases, thereby permitting navigation planners not only to consider operator costs but also the expected costs and benefits on either an individual or combined user group basis. The model's outputs will also be useful to individual user groups in assessing their position vis-a-vis navigation system policy alternatives. P.T.H.

A82-12641 # **Simulation study of a hybrid strapdown attitude and heading reference system.** D. B. Reid, B. N. McWilliam (Philip A. Lapp, Ltd., Toronto, Canada), and D. F. Liang (Defence Research Establishment, Ottawa, Canada). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 139-147. 13 refs.

The aircraft attitude and heading reference system (AHRS) considered in this paper comprises a low-accuracy strapdown inertial measurement unit (IMU), a strapdown magnetometer triad, which provides reference heading information, and air data sensors from which barometric altitude and true airspeed measurements are derived. A variable-dimension U-D factorized Kalman filter is employed to estimate the AHRS error state from the redundant sensor data. Estimated errors are fed back into the system using a combination of continuous and impulsive control methods to bound the inertial attitude, heading, and velocity errors and reduce the rate of position error growth. A data compression algorithm is employed for smoothing of incoming measurement data to enable high-rate information to be incorporated into the filtering process at minimum computational cost. The system operates in three modes: normal AHRS mode, alignment (erection) mode and magnetics calibration mode, in which the U-D filter is utilized to estimate systematic errors in the sensed magnetic field during a ground 'swing' procedure. Initial results obtained by full-scale simulation indicate that, with a low-accuracy strapdown IMU, the system can achieve roll and pitch accuracies of about 5 arc minutes (RMS) and a heading accuracy of approximately .75 degree (RMS). (Author)

A82-12642 # **The integrated inertial sensor assembly /IISA/ - A redundant strapdown system for advanced aircraft navigation and flight control functions.** M. S. Dipasquo (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 153-162.

In order to achieve the benefits of an integrated inertial sensor assembly (IISA) for the next generation aircraft, the U.S. Navy has embarked on an advanced development program to demonstrate the IISA concept. This paper examines the requirements definition, the system concept formulation, and the design definition of the advanced development model (ADM) that will be used for concept validation in a later flight test program. P.T.H.

A82-12643 # **Integrated satellite navigation and strapdown attitude and heading reference systems for civil air carriers.** J. J. Hopkins (Navigation Development Services, Inc., Northridge, CA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 163-170. 17 refs.

The potential of the integrated GPS navigator and the strapdown AHRS as a replacement for several existing avionics systems is investigated. Its application is discussed including the economic impact with regard to acquisition and maintenance. The system components and integration approach are described, and the expectations for favorable performance comparisons with its competition are presented. It is concluded that the economic and performance advantages are unmistakably outstanding. Consequently, to save costs and to safely handle increased traffic there is a strong likelihood that integrated GPS/AHRS will become the standard position, velocity, and attitude reference system for future civil aircraft. P.T.H.

A82-12644 # **Ring Laser Gyro Navigator /RLGN/ flight test results.** K. L. Bachman (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 171-178.

This paper describes a flight test program and the resultant navigation performance achieved on an Advanced Development Model (ADM) Ring Laser Gyro Navigator (RLGN) in Navy A-7E and P-3C aircraft. As the RLGN represents a significant departure from conventional gimballed inertial system technology, a brief functional system description is given highlighting key hardware and software design features. This is followed by a description of the A-7E flight test program, its objective, flight profiles, method of data acquisition, and analysis of results. The P-3C flight test program is discussed including a description of the flight test recording instrumentation, flight profiles, data reduction, and analysis of results. An indication of system reliability, maintenance, and calibration actions versus system design goals is given. Effects of high latitude on system alignment and navigation performance are also highlighted. (Author)

A82-12646 **Kevlar composites; Proceedings of the Symposium, El Segundo, CA, December 2, 1980.** Symposium sponsored by the Technology Conferences. El Segundo, CA, Technology Conferences, 1980. 96 p. $24.

Papers presented cover Kevlar-49 properties and Kevlar/epoxy composite materials. Kevlar roles in the aerospace industry were noted in the design of the L-1011 Tristar components, in the materials processing for commercial aircraft, and applications in commuter aircraft; additional papers describe Kevlar use in life-saving equipment, for rocket motors, pressure vessels, and fuel tanks. Finally, the methods and tools necessary for using Kevlar are presented. D.H.K.

A82-12647 **Seven years experience with Kevlar-49 in the Lockheed L-1011 Tristar.** R. H. Stone (Lockheed-California Co., Burbank, CA). In: Kevlar composites; Proceedings of the Symposium, El Segundo, CA, December 2, 1980. El Segundo, CA, Technology Conferences, 1980, p. 25-43.

A history of the use of Kevlar-49 in aircraft structures is presented. The aramid fibers provide a 25-30% weight reduction over fiberglass with 1.5 times the stiffness, in addition to comparable tensile strength; compressive strength is lower, though acceptable. Aircraft parts were fabricated on fiberglass production equipment using epoxy resin prepregs and tested for durability, impact resistance, and flammability; all were found to be comparable to fiberglass. Wing body sandwich fairings, underwing fillet panels, and aft engine fairings were built, tested for aerodynamic loads, and found acceptable in a NASA flight service program. The parts were then mounted on Lockheed L-1011's for use in commercial airline service; after 90,000 flying hours wear was equivalent to the use of fiberglass. Interior and exterior applications in aircraft, such as for rudder and trailing edge flaps, are discussed. D.H.K.

A82-12684 **Wings in the sun - The evolution of Solar Challenger.** M. Cowley. *Flight International,* vol. 119, June 13, 1981, p. 1866-1868.

The design, development and testing of the Solar Challenger aircraft are described, with attention to its lightweight structural design and photovoltaic cell array-powered electric propulsion system. The configuration features a cantilever wing and horizontal tail, whose upper surfaces support 236 sq ft of solar cells that are rated at 13% conversion efficiency. The main wing spar and fuselage boom are constructed by wrapping a carbon fiber tube with 1/4-in.-thick Nomex honeycomb, followed by two layers of Kevlar cloth. Flutter tests of the airframe have been conducted at speeds of up to 65 mph by mounting the tail, fin and wing on a van. The aircraft is designed for 100-mile flights at 8000-10,000 ft altitudes and 25-35 mph, but the nearly horizontal mounting of the solar cells restricts flight conditions to those with high sun angles, at midday. When the sun is low in the sky, as in winter, the Solar Challenger must fly due north to maximize insolation. O.C.

A82-12696 # **Helicopter icing spray system - Improvements and flight experience.** D. Belte (U.S. Army, Edwards AFB, CA). *(Canadian Aeronautics and Space Institute, Flight Test Symposium, Medley, Alberta, Canada, Mar. 31, Apr. 1, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, 2nd Quarter, 1981, p. 93-106. 8 refs.

In 1979 improvements were made to the helicopter icing spray system used in icing qualification tests. The improvements were aimed at reducing drop diameter and eliminating ice formation on the spray boom. A Sonicore nozzle was selected to replace the original atomizers and the number of atomizers on the spray boom was tripled. The newly modified configuration was evaluated using a UH-1H helicopter. Measurements were made of drop size distribution and liquid water content. Spray cloud measurements showed great improvement over earlier characteristics, and the median volumetric diameter approached that of natural clouds. The types of ice formation also reflected the improvement in cloud quality. Since in-flight spray simulation cannot duplicate the 100% relative humidity of a natural icing cloud, a computer program was developed to define the evaporation effect on liquid water content. An expanded airspeed range was used for 1980-1981 tests and results were compiled for the UH-60A, UH-1H ice phobics, Bell Model 412 and Grumman OV-1D. S.C.S.

A82-12697 # **Fractographic determination of fatigue crack growth rates in aircraft components.** W. Wiebe and R. V. Dainty (National Aeronautical Establishment, Structures and Materials Laboratory, Ottawa, Canada). *(Canadian Aeronautics and Space Institute, Annual General Meeting, Montreal, Canada, May 11, 12, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, 2nd Quarter, 1981, p. 107-117.

The application of electron fractography to the failure analysis of aircraft components is considered to be rewarding because it frequently permits the precise identification of the causes of component failure. Quantitatively, considerable effort has been devoted to the development of techniques specifically directed to the evaluation of fatigue crack growth rate information, both from service fatigue failures, and from components fractured during full-scale aircraft laboratory fatigue tests. Originally, the fractographic determination of crack growth rate data in these laboratory tests was relatively straightforward, since discrete numbers of load cycles were applied at each of the various load levels in the fatigue loading spectrum. However, recent use of computer-controlled random fatigue loading equipment has produced new problems associated with the identification and correlation of the randomly spaced fatigue striations on the fracture surface, and the derivation of crack growth rate data from them. The fractographic methods developed for the solution of these problems are described. (Author)

A82-12698 # **SARSAT applications.** W. R. McPherson (Defence Research Establishment, Ottawa, Canada). *(Canadian Aeronautics and Space Institute, Canadian Conference on Astronautics, 1st, Ottawa, Canada, Oct. 20-22, 1980.) Canadian Aeronautics and Space Journal,* vol. 27, 2nd Quarter, 1981, p. 118-126.

The SARSAT system is designed to utilize satellite technology for the rapid detection and location of marine and air distress incidents. The system consists of (1) emergency beacons for small aircraft and boats operating at 406 MHz; (2) space components including on-board receivers and processors; and (3) a ground receiving station with related communication links. The system is expected to detect an emergency beacon within six hours of its activation with local accuracy to the order of 20 km at present, and 5 km or better for the 406 MHz test units. The first SAR instrumented spacecraft will be launched in mid-1982. Five countries are presently involved in the project, including the USSR COSPAS/-SARSAT project and the SARSAT Investigator in Norway. S.C.S.

A82-12775 **F-5G Tigershark.** D. Richardson. *Flight International,* vol. 120, Oct. 17, 1981, p. 1144-1150.

Design features, production goals, and potential markets for the F-5G fighter are reviewed. The aircraft was developed as a counter to the MiG-23 and third generation MiG-21. A GE F404 turbofan engine was chosen, with space left in the redesigned fuselage to accommodate minor engine improvements. A Mach 2 top speed is noted, and an 8,000 hr service life with a 9 g limiting load is projected; fuel consumption is lower than in the F5-E with more available thrust. Design changes affected the rear fuselage profile, added a carbon composite tailplane, spar, and vertical fin, thicker wing skins to withstand 9 g combat maneuvers, and a larger canopy for greater visibility, in addition to instrument console flexibility. Armament options are provided, with mounts capable of using non-US ordnance; performance characteristics, including the 16,400 lb thrust are given, along with estimated selling price and production schedules. Over 90% of the ground support equipment of the F5-E is mentioned as being compatible with the F-5G. M.S.K.

A82-12801 # **The case for a defensive air-to-air fighter.** W. Hill, Jr. (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA). *Astronautics and Aeronautics,* vol. 19, Nov. 1981, p. 28-36.

An investigation is conducted regarding the approaches available to compensate for the imbalance of tactical air power which favors the Soviets/Warsaw Pact over the U.S./NATO forces, taking into account the constraints of the U.S. Air Force budget. One approach can be to increase the fighter procurement monies, by reducing other budget items, to buy large quantities of the expensive multimission fighter. However, in connection with budgetary considerations related to the urgency of other requirements, it appears that new aircraft the size and capability of the F-15 and F-16 cannot be obtained in quantities sufficient to gain parity with Soviet air forces. It is, therefore, proposed to employ a single-mission aircraft which, because of its simple design and low cost, can be built in quantity. This proposal is based on the recognition that an effective NATO interceptor does not need all the capabilities of the F-15 and F-16. G.R.

A82-12803 * # **Solution to the hidden-line problem.** D. R. Hedgley (NASA, Flight Research Center, Edwards AFB, CA). *Astronautics and Aeronautics,* vol. 19, Nov. 1981, p. 51.

It is pointed out that realistic three-dimensional renderings of solid objects or surfaces by computers have long been needed. The NASA Dryden Flight Research Center will soon publish a report and the computer program on an algorithm that solves for hidden lines. The computer program is written in FORTRAN IV and its size is approximately 35N + 9500 words, where N is the number of elements. A number of pictures are presented which were drawn by a computer using the algorithm. G.R.

A82-12804 # **Parachute technology under pressure.** E. A. Reed (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). *Astronautics and Aeronautics,* vol. 19, Nov. 1981, p. 56-61. 22 refs.

A description is presented of advances in specific areas of parachute technology, taking into account developments occurring since 1975. It is pointed out that stress and parachute design analysis continue to have the same needs as in 1975. Some analytic work has related nonlinear elasticity, energy dissipation and textile weave to the propagation of step strain pulses due to snatch or impact loadings. Sophisticated computer programs exist for stress analysis of parachutes and for calculating their opening load. Attention is given to the improved performance of new textile materials, possibilities for improvements related to supersonic parachutes, aspects of parachute packing, and developments concerning ejection seats. G.R.

STAR ENTRIES

N82-10002# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Festigkeit.

MATHEMATICAL MODEL FOR THE MAINTENANCE PROGRAM OF MODERN JET AIRCRAFT

Rudolf Prinz, Hans-Christian Goetting, Karl-Heinz Galda (Deutsche Lufthansa A.G., Hamburg), and Juergen Kreth (Deutsche Lufthansa A.G., Hamburg) Oct. 1980 44 p refs In GERMAN; ENGLISH summary Report will also be announced as Translation (ESA-TT-724)
(DFVLR-FB-81-14) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 10,40

Step-by-step escalation of structural inspection intervals based on long-term experience with a fleet of transport aircraft is described by a mathematical model. Fundamental to the model are statistical distributions of load and detectable crack length in a fatigue loaded component. Knowing realistic probabilities of failure enables the calculation of appropriate inspection intervals. Calculation procedure yields increasing intervals up to a maximum value and a decrease when approximating the mean value of detectable crack length. As to usual interval steps, the results show good agreement with practice. Restrictions and possible applications of the model are discussed. Author (ESA)

N82-10016# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

STANDARD TESTS OF A RESEARCH MODEL ROTOR IN A WIND TUNNEL, INCLUDING MODEL SIMILARITY [STANDARD-ERPROBUNG DES FORSCHUNGS-MODELLROTORS IM WINDKANAL, EINSCHLIESSLICH MODELLVERGLEICHEN]

R. Stricker, V. Mikulla, and E. Allramseder Bonn Bundesministerium der Verteidigung 1979 93 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-79-16) Avail: NTIS HC A05/MF A01; Dokzentbw, Bonn DM 30

A wind tunnel test program was developed, as a basis the actual flight regime of the BO-105 helicopter. Operation of the test stand and calibration of measuring devices is described. The procedure for data reduction (digital programs) is given. Results include the parameters: mean and fluctuating components of rotor forces and moments; blade bending moments (flapping, lagging); and control forces. Control and static stability derivatives are also determined. The calculations done for comparison with measurements, using aerodynamic/aeroelastic/flight mechanic digital programs, show in almost all cases very good agreement with model test results. The correlation with flight test data of the BO-105 helicopter shows that model similarity according to the most important scaling laws is fulfilled to a high degree and that the results can be used for real comparison of various sizes of hingeless helicopter rotors. Author (ESA)

N82-10017# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Experimentelle Stroemungsmechanik.

EXPERIMENTAL INVESTIGATIONS OF THE SEPARATED FLOW AROUND A RECTANGULAR WING

Hans Bippes, Michael Turk, and Klaus Jacob Oct. 1980 56 p refs In GERMAN; ENGLISH summary
(DFVLR-FB-81-12) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 10

For the aspect ratios lambda = 3.1 and 2.3, pressure distributions over the whole span were measured at angles of attack up to alpha approximately = 27 deg. For selected cases, oil flow patterns were produced and velocity profiles behind the wing along with shear stresses at the surface were measured. Most of the model and the experiments were carried out at Re approximately = 2,100,000 and M approximately = 0.17. The model and the experiments are described. The results are discussed and partly compared with results from a theoretical model. Author (ESA)

N82-10020# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

AIRCRAFT EXCRESCENCE DRAG

A. D. Young, J. H. Paterson, and J. Lloyd Jones, ed. Jul. 1981 172 p refs
(AGARD-AG-264; ISBN-92-835-1392-4) Avail: NTIS HC A08/MF A01

A review was undertaken of the available data on the subject of the drag of excrescences on aircraft surfaces. Information from this review is summarized and presented in a way that is readily usable for prediction and design purposes. The basic characteristics of boundary layers are discussed and, where possible, the drag of excrescences is related to those characteristics. In particular, because the size of many types of surface imperfection is small in comparison with boundary layer thicknesses, the drag of such imperfections can be correlated in terms of the properties of inner regions of the boundary layer. Several previously published analyses of this type are highlighted and, where possible, extensions to other data sources or other types of excrescence are presented. The practical problems of applying these data in the varying velocity gradients existing on aircraft surface are treated and one section is devoted to the drag of auxiliary air inlet and exit openings. Gaps in existing data which offer opportunities for research effort are pointed out. J.M.S.

N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.

ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report

David L. Kohlman, William G. Schweikhard, and Alan E. Albright Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

N82-10022# Committee on Science and Technology (U. S. House).

SPIN RECOVERY TRAINING

Washington GPO 1980 15 p Presented by the Subcomm. on Invest. and Oversight of the Comm. on Sci. and Technol., 96th Congr., 2nd Sess., Jul. 1980
(GPO-66-020) Avail: Subcommittee on Investigations and Oversight

The FAA policy of not requiring spin recovery training as a prerequisite for a private pilot license was examined in an effort to determine if such a requirement would result in a net savings of life. Only FAA remained adamant in defense of the no-spin training policy. All other witnesses, to varying degrees, expressed the need for spin and recovery training as a common sense safety requirement. It can be concluded without equivocation that experienced aviators overwhelmingly demand that aspiring pilots be trained to protect themselves and be able to recover from post stall gyrations, incipient spins, and spins. The subcommittee's recommendations that such training be required for licensing is discussed with emphasis on the development of a flight training manual and an implementation plan. A.R.H.

N82-10023# Naval Postgraduate School, Monterey, Calif. Dept. of Operations Research.

A PROPOSED FLIGHT SAFETY PROGRAM FOR THE KOREAN AIR FORCE M.S. Thesis

Chong Kwan Lee Mar. 1981 136 p refs
(AD-A102373) Avail: NTIS HC A07/MF A01 CSCL 05/1

Several methodologies relevant to the development of a safety program for the Korean Air Force were reviewed. Methodologies considered included: Control charts; System safety analysis; and

Critical incident technique. Data collection methods applicable to accident analysis were proposed. Recommendations for the incorporation of these methods into a safety program for the K.A.F. were developed. The safety program described in this thesis possesses the potential for reducing overall operational costs and maximizing aircraft availability. The end result of such a program can only serve to increase operational readiness and thereby maximize overall efficiency and military capability of the K.A.F. GRA

N82-10024# Research Inst. of National Defence, Stockholm (Sweden). Huvudavdelning 2.
LIGHTNING EFFECTS ON AIRCRAFT AND COMPOSITES. LITERATURE STUDY ON LIGHTNING STRIKES AND PROTECTION [VERKAN AV BLIXT I FLYGPLAN OCH KOMPOSITER. LITTERATURSTUDIE OEVER SKADOR OCH SKYDD]
Anita Alm Nov. 1980 102 p refs In SWEDISH
(FOA-C-20388-F8) Avail: NTIS HC A06/MF A01

The frequency and different types of lightning strike on different parts of aircraft and several ways of protection against direct and indirect lightning effects were reviewed. Fiber composites, lightning damage and testing of lightning protection for modern aircraft material are studied by means of simulation techniques. Unshielded composite materials are damaged by lightning. With a correctly shaped lightning shield damage can be prevented. Author (ESA)

N82-10025# Societe Nationale Industrielle Aerospatiale, Paris (France).
COST REDUCTION IN AIR TRANSPORTATION
P. Labouc 1980 21 p Presented at French Aerospace Week, Indonesia, 8-12 Dec. 1980
(SNIAS-811-150-101) Avail: NTIS HC A02/MF A01

Historical trends in costs are reviewed. By adopting fuel conservation policies, such as renewal of the jet fleet, adaptation of flight operation, and modification of air traffic control procedures, the airlines can limit the effect of expected fuel price increases. In parallel, productivity gains should keep at a constant level all the other costs of airline operations. Under the above conditions, growth of the industry seems to be certain even if fuel prices increase at a rate of 2 to 4% per year above inflation during the next 20 years. Author (ESA)

N82-10026# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bonn (West Germany). Inst. fuer Flugmedizin.
DEVELOPMENT AND CONSTRUCTION OF PILOT EJECTOR SEATS IN GERMANY FROM 1939-1945
Siegfried Ruff Feb. 1981 110 p refs In GERMAN; ENGLISH summary
(DFVLR-FB-81-04) Avail: NTIS HC A06/MF A01; DFVLR, Cologne DM 26

Pioneering research, leading to the development of an ejector seat for the Junkers Ju 88, is reviewed. Fundamentals in establishing human acceleration tolerances are discussed. The experimental simulation of shock induced acceleration is described, and human resistance is quantified. Exploitation and follow-up of accident related data are summarized, including investigations of the accelerations experienced with an aircraft out of control, e.g., shot down. The action of airspeed pressure on a person is considered, and experience gained with research aircraft is recounted. Measuring methods for technical and physiological parameters are indicated. The beginning of ejector seat development in England, Sweden, and the U.S. (1944-45) is also briefly reviewed in comparison. Author (ESA)

N82-10027# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
THE STATISTICAL THEORY OF RADIO DIRECTION FINDING
R. L. Holland Jun. 1981 47 p refs
(Contract N00024-81-C-5301)
(AD-A104156; JHU/APL/TG-1330) Avail: NTIS HC A03/MF A01 CSCL 17/3

The statistical theory of radio direction finding as it applied to three-dimensional geometrics is presented in this report. This theory is an extension of the two-dimensional theory presented by R. G. Stansfield in 1947. The theory has application in situations where airborne targets are maneuvering in three dimensions at high speed, especially when the platforms with the direction finding equipment are also aircraft. Author (GRA)

N82-10028*# Wyle Labs., Inc., Huntsville, Ala.
EXPERIMENTAL MODAL ANALYSIS OF THE FUSELAGE PANELS OF AN AERO COMMANDER AIRCRAFT Final Report
David Geisler Sep. 1981 164 p refs Prepared in cooperation with Structural Dynamics Res. Corp., Cincinnati, Ohio
(Contract NAS1-14693)
(NASA-CR-165750; Rept-10568) Avail: NTIS HC A08/MF A01 CSCL 01C

The reduction of interior noise in light aircraft was investigated with emphasis the thin fuselage sidewall. The approach used is theoretical and involves modeling of the sidewall panels and stiffeners. Experimental data obtained from tests investigating the effects of mass and stiffness treatments to the sidewalls are presented. The dynamic characteristics of treated panels are contrasted with the untreated sidewall panels using experimental modal analysis techniques. The results include the natural frequencies, modal dampling and mode shapes of selected panels. Frequency response functions, data relating to the global fuselage response, and acoustic response are also presented. J.M.S.

N82-10029*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
V/STOL AIRCRAFT AND FLUID DYNAMICS
Leonard Roberts (Stanford Univ., Calif.) and Seth B. Anderson Oct. 1981 8 p refs
(NASA-TM-81328; A-8730) Avail: NTIS HC A02/MF A01 CSCL 01C

The impact of military applications on rotorcraft and V/STOL aircraft design is summarized with respect to fixed-wing aircraft. The influence of the mission needs on the configurational design of V/STOL aircraft, the implications regarding some problems in fluid dynamics relating to propulsive flows, and their interaction with the aircraft and the ground plane, are also considered. Additional research in fluid dynamics that can contribute to an improvement in performance of V/STOL aircraft is suggested. B.W.

N82-10030*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN INVESTIGATION OF A STOPPABLE HELICOPTER ROTOR WITH CIRCULATION CONTROL
John D. Ballard, John L. McCloud, III, and T. J. Forsyth Aug. 1980 372 p refs
(NASA-TM-81218; A-8278) Avail: NTIS HC A16/MF A01 CSCL 01C

A stoppable helicopter rotor with circulation control was investigated in the Ames 40 by 80 foot wind tunnel. The model was tested as a rotating wing, a fixed wing, and during transition start/stop sequences. The capability of the model's control system to maintain pitch and roll moment balance during the start/stop sequence, the ability of the blades to withstand the start/stop loads, the adequacy of the control system to maintain balance in the helicopter mode, and the control system capabilities in the fixed-wind mode were assessed. Time-history data of several start/stop sequences of the X-wing rotor, and the steady-state data relating to the model as both a rotor and as a fixed-wing aircraft are presented. In addition, stability data are presented which were acquired during open-loop and closed-loop tests of the hub moment feedback control system. J.M.S.

N82-10031*# National Aeronautics and Space Administration, Washington, D. C.
QUIET SHORT-HAUL RESEARCH AIRCRAFT FAMILIARIZATION DOCUMENT, REVISION 1
Joseph C. Eppel Sep. 1981 81 p refs
(NASA-TM-81298; A-8601) Avail: NTIS HC A05/MF A01 CSCL 01C

The design features and general characteristics of the Quiet Short Haul Research Aircraft are described. Aerodynamic characteristics and performance are discussed based on predictions and early flight test data. Principle airplane systems, including the airborne data acquisition system, are also described. The aircraft was designd and built to fulfill the need for a national research facility to explore the use of upper surface blowing, propulsive lift technology in providing short takeoff and landing capability, and perform advanced experiments in various technical disciplines such as aerodynamics, propulsion, stability and control, handling qualities, avionics and flight control systems, trailing vortex phenomena, acoustics, structure and loads, operating systems, human factors, and airworthiness/certification criteria. An unusually austere approach using experimental shop practices resulted in a low cost and high research capability. Author

N82-10032*# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering and Mechanics.
COMPARATIVE STUDY OF FLARE CONTROL LAWS Final Report, 15 Dec. 1979 - 15 Oct. 1981
A. A. Nadkarni Oct. 1981 52 p refs
(Grant NsG-1480)
(NASA-CR-164903) Avail: NTIS HC A04/MF A01 CSCL 01C

The development of a digital, three dimensional, automatic control law designed to achieve an optimal transition of a B-737 aircraft between glide slope conditions and the desired final touchdown condition is presented. The digital control law is a time invariant, state estimate feedback law, and the design is capable of using the microwave landing system. Major emphasis is placed on the reduction of aircraft noise in communities surroundings airports, the reduction of fuel consumption, the reduction of the effects of adverse weather conditions on aircraft operations, and the efficient use of airspace in congested terminal areas. Attention is also given to the development of the capability to perform automatic flares from steep glide slopes to precise touchdown locations. B.W.

N82-10033# Aberdeen Univ. (Scotland). Dept. of Engineering.
APPLICATION OF NUMERICAL METHODS TO THE CALCULATION OF ELECTROSTATIC FIELDS IN AIRCRAFT FUEL TANKS Final Scientific Report, 1 Jul. 1980 - 30 Jun. 1981
J. R. Smith, P. Lees, and D. McAllister Aug. 1981 65 p refs
(Grant AF-AFOSR-0223-80; AF Proj. 2301; AF Proj. 3048)
(AD-A103270; EOARD-TR-81-9) Avail: NTIS HC A04/MF A01 CSCL 01/3

The solution of electrostatic field problems occurring during the refueling of aircraft fuel tanks containing explosion suppressant foams is discussed. A computational model of a fuel tank is set up, and the finite element method is used to calculate the electrostatic potential distribution within the tank. Author (GRA)

N82-10034# Boeing Military Airplane Development, Seattle, Wash.
LOW MAINTENANCE HYDRAULIC ACCUMULATOR Final Report, Aug. 1976 - Dec. 1980
E. C. Wagner and W. E. Willard Jun. 1981 65 p
(Contract F33615-76-C-2066; AF Proj. 3145)
(AD-A103947; AFWAL-TR-81-2031) Avail: NTIS HC A04/MF A01 CSCL 13/7

This report presents the results of a program to develop a low maintenance accumulator, compatible with current MS envelopes and competitive in cost with conventional accumulators. The purpose of the program was to select and develop a metal bellows configuration/concept to replace the conventional moving piston and seal of conventional accumulators. The selected bellows are of welded construction and welded in place to allow bellows movement identical to piston movement. The accumulator housing is of welded construction to eliminate all possible leak points. The program goal was to develop an accumulator to provide a ten year unserviced life. Test results indicate an accumulator design is possible to achieve a service life of 8 to 10 years based on installation on an F-16 aircraft. Author (GRA)

N82-10035# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
A CFRP TAILERON FOR THE TORNADO: CONSTRUCTION AND PRODUCTION [CFK-TAILERON FUER DEN TORNADO: KONSTRUKTION UND FERTIGUNG]
L. Lemmer, W. Hartmann, and R. Guenther 1980 67 p In GERMAN Presented at Gastvortrag im KL 624, Mannheim, West Germany, 10-14 Nov. 1980
(MBB-FE-212/KFK/PUB/2) Avail: NTIS HC A04/MF A01

A CFRP lightweight structure, i.e., CFRP taileron, for the Tornado aircraft was developed. The CFRP taileron is interchangeable with the currently used metal horizontal stabilizer as far as geometry, function and durability are concerned while a 30% weight reduction is achieved with CFRP construction. The assembly of the CFRP taileron is detailed and results from static, dynamic, and vibration testing of the structure are presented. A series production method is then outlined, including inspection and certification procedures. Author (ESA)

N82-10036# European Space Agency, Paris (France).
THEORETICAL INVESTIGATION OF THE INFLUENCE OF SPOILER DYNAMICS ON THE HANDLING QUALITIES OF AN AIRCRAFT WITH DIRECT LIFT CONTROL
Dieter Schafranek Jul. 1981 66 p refs Transl. into ENGLISH of "Theoretische Untersuchung ueber den Einfluss der Spoilerdynamik auf die Fliegbarkeit eines Flugzeugs mit direkter auftriebsteuerung" Rept. DFVLR-FB-80-07 DFVLR, Brunswick, 1980 Original report in GERMAN previously announced as N81-13075
(ESA-TT-661; DFVLR-FB-80-07) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 14,70

Theoretical parameters describing the pilot's workload during aircraft control pitch tracking and flight path tracking tasks on a transport aircraft equipped with spoiler direct lift control (DLC) were studied. The determined parameters are the necessary phase compensation and gain adaptation which the pilot must perform, and also the closed loop resonance. The influence of the DLC-gain factor, spoiler actuator rate, and spoiler deflection washout time constant on pilot workload is presented. Simulated time histories of pitch rate and normal acceleration responses due to step type control inputs show the corresponding reactions of the various DLC-configurations which are essential for pitch control and flight path control. Direct lift control using spoilers is shown to be sensible for the aircraft in the test only if the pitching moment of the spoiler is completely compensated, the time constant for the spoiler deflection washout is not too small (greater than 5 seconds) and if the spoiler moves with more delay than the elevator. Author (ESA)

N82-10037*# Detroit Diesel Allison, Indianapolis, Ind.
PROPULSION STUDY FOR SMALL TRANSPORT AIRCRAFT TECHNOLOGY (STAT) Contractor Final Report
J. C. Gill, R. V. Earle, D. V. Staton, P. C. Stolp, D. S. Huelster, and B. A. Zolezzi 15 Dec. 1980 186 p refs
(Contract NAS3-21995)
(NASA-CR-165499; DDA-EDR-10470) Avail: NTIS HC A09/MF A01 CSCL 21E

Propulsion requirements were determined for 0.5 and 0.7 Mach aircraft. Sensitivity studies were conducted on both these aircraft to determine parametrically the influence of propulsion characteristics on aircraft size and direct operating cost (DOC). Candidate technology elements and design features were identified and parametric studies conducted to select the STAT advanced engine cycle. Trade off studies were conducted to determine those advanced technologies and design features that would offer a reduction in DOC for operation of the STAT engines. These features were incorporated in the two STAT engines. A benefit assessment was conducted comparing the STAT engines to current technology engines of the same power and to 1985 derivatives of the current technology engines. Research and development programs were recommended as part of an overall technology development plan to ensure that full commercial development of the STAT engines could be initiated in 1988. T.M.

N82-10038*# Detroit Diesel Allison, Indianapolis, Ind.
PROPULSION STUDY FOR SMALL TRANSPORT AIRCRAFT TECHNOLOGY (STAT), APPENDIX B Final Report
[1980] 11 p refs
(Contract NAS3-21995)
(NASA-CR-165499-App-B; DDA-EDR-10470-App-B) Avail: NTIS HC A02/MF A01 CSCL 21E

Data are tabulated for two conceptual engines designed for small transport aircraft. These are the 1790 W (2400 shp) class engine and the 3579 kW (4800 shp) class engine for the 0.5 M sub N and 0.7 M sub N airplanes, respectively. All data points required to perform the STAT missions are provided including take-off, climb, cruise, loiter, and fuel allowances. The weight, dimensions, price, and maintenance costs are given as well as the installation criteria and equations used for adjusting horsepower for gearbox loss, and converting horsepower to thrust. Scaling equations are included. A.R.H.

N82-10039*# United Technologies Research Center, East Hartford, Conn.
DEVELOPMENT OF LOW MODULUS MATERIAL FOR USE

IN CERAMIC GAS PATH SEAL APPLICATIONS Final Report
H. E. Eaton and R. C. Novak Oct. 1981 83 p refs
(Contract NAS3-22134)
(NASA-CR-165469; R81-915189-13) Avail: NTIS HC A05/MF A01 CSCL 21E

Three candidate materials were examined: Brunsbund (I Pad; plasma sprayed porous NiCrAlY; and plasma sprayed low modulus microcracked zirconia. Evaluation consisted of mechanical, thermophysical, and oxidation resistance testing along with optical microscopy and a feasibility demonstration of attaching the material to a suitable substrate. The goals of the program were the following: feasibility of fastening or depositing the low modulus system onto a broad range of substrate alloys; feasibility of depositing or forming the low modulus system to a thickness of 0.19 cm to 0.38 cm; potential to attain a modulus of elasticity in the range of 3.4 to 6.9 GPa (0.5 to 1.0 MSI), and an ultimate strength of 17.2 MPa (2.5 ksi); suitable thermal conductivity; and static oxidation life of at least 1000 hours at 1311 K. The results of the program indicate that all three systems offer attractive properties as a strain isolator material. T.M.

N82-10040*# General Electric Co., St. Petersburg, Fla.
THERMAL-BARRIER-COATED TURBINE BLADE STUDY Final Report
P. A. Siemers and W. B. Hillig Aug. 1981 134 p refs
(Contract NAS3-21727)
(NASA-CR-165351; SRD-81-083) Avail: NTIS HC A07/MF A01 CSCL 21E

The effects of coating TBC on a CF6-50 stage 2 high-pressure turbine blade were analyzed with respect to changes in the mean bulk temperature, cooling air requirements, and high-cycle fatigue. Localized spallation was found to have a possible deleterious effect on low-cycle fatigue life. New blade design concepts were developed to take optimum advantage of TBCs. Process and material development work and rig evaluations were undertaken which identified the most promising combination as ZrO2 containing 8 w/o Y2O3 applied by air plasma spray onto a Ni22Cr-10Al-1Y bond layer. The bond layer was applied by a low-pressure, high-velocity plasma spray process onto the base alloy. During the initial startup cycles the blades experienced localized leading edge spallation caused by foreign objects. T.M.

N82-10041*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DETERMINATION OF AIRPLANE MODEL STRUCTURE FROM FLIGHT DATA BY USING MODIFIED STEPWISE REGRESSION
Vladislav Klein (Joint Inst. for Advancement of Flight Sciences, Hampton, Va.), James G. Batterson, and Patrick C. Murphy Oct. 1981 48 p refs
(NASA-TP-1916; L-14613) Avail: NTIS HC A03/MF A01 CSCL 01C

The linear and stepwise regressions are briefly introduced, then the problem of determining airplane model structure is addressed. The MSR was constructed to force a linear model for the aerodynamic coefficient first, then add significant nonlinear terms and delete nonsignificant terms from the model. In addition to the statistical criteria in the stepwise regression, the prediction sum of squares (PRESS) criterion and the analysis of residuals were examined for the selection of an adequate model. The procedure is used in examples with simulated and real flight data. It is shown that the MSR performs better than the ordinary stepwise regression and that the technique can also be applied to the large amplitude maneuvers. T.M.

N82-10042*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ESTIMATION OF AIRPLANE STABILITY AND CONTROL DERIVATIVES FROM LARGE AMPLITUDE LONGITUDINAL MANEUVERS
James G. Batterson Oct. 1981 43 p refs
(NASA-TM-83185; L-14524) Avail: NTIS HC A03/MF A01 CSCL 01C

The application of a modified stepwise regression algorithm to both a complete data string and to that same data partitioned into bins as a function of angle of attack was demonstrated. Results from the large-scale maneuver agree well with results from 20 maneuvers in which small perturbation from trim at various angles of attack were induced. T.M.

N82-10043*# Lear Siegler, Inc., Santa Monica, Calif. Astronics Div.
DEVELOPMENT AND EVALUATION OF AUTOMATIC LANDING CONTROL LAWS FOR LIGHT WING LOADING STOL AIRCRAFT
B. Feinreich, O. Degani, and G. Gevaert Jul. 1981 371 p refs
(Contract NAS2-9410)
(NASA-CR-166180) Avail: NTIS HC A16/MF A01 CSCL 01C

Automatic flare and decrab control laws were developed for NASA's experimental Twin Otter. This light wing loading STOL aircraft was equipped with direct lift control (DLC) wing spoilers to enhance flight path control. Automatic landing control laws that made use of the spoilers were developed, evaluated in a simulation and the results compared with these obtained for configurations that did not use DLC. The spoilers produced a significant improvement in performance. A simulation that could be operated faster than real time in order to provide statistical landing data for a large number of landings over a wide spectrum of disturbances in a short time was constructed and used in the evaluation and refinement of control law configurations. A longitudinal control law that had been previously developed and evaluated in flight was also simulated and its performance compared with that of the control laws developed. Runway alignment control laws were also defined, evaluated, and refined to result in a final recommended configuration. Good landing performance, compatible with Category 3 operation into STOL runways, was obtained. Author

N82-10044# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).
ACTIVE CONTROL ELEMENTS ON THE TRANSONIC WING OF THE AIRBUS A-300 (ACTTA A). AIRBUS A-300 WITH REDUCED LONGITUDINAL STABILITY (ACTTA-C) [AKTIVE STEUERELEMENTE AM TRANSSONISCHEN FLUEGEL DES AIRBUS A300 (ACTTA A). AIRBUS A300 MIT REDUZIERTER LAENGSSTABILITAET (ACTTA-C)]
H. G. Klug 1980 34 p In GERMAN Presented at 2nd Bundesministerium fuer Forschung und Technologie Statusseminar Luftfahrtforsch. und Luftfahrtechnol., Garmisch-Partenkirchen, West Germany, 8-9 Oct 1980
Avail: NTIS HC A03/MF A01

Two projects concerned with the development and design optimization of the Airbus A-300 are reviewed. Studies related to active control are discussed. Investigations specific to gust loading and maneuver induced loading of the A-300 structure are emphasized. Results influence design criteria, e.g., open or closed loop control, sensor selection, etc. Reduced longitudinal stability of the A-300 is then considered as a tradeoff in favor of weight reduction through the use of lightweight materials. Wind tunnel and other simulation tests are described.
Author (ESA)

N82-10045# European Space Agency, Paris (France).
SYSTEM IDENTIFICATION OF THE LONGITUDINAL MOTION OF THE DFVLR HFB 320 RESEARCH AIRCRAFT WITH PARTICULAR CONSIDERATION OF CONTROL SURFACE EFFECTIVENESS
Ohad Rix Apr. 1981 55 p refs Transl. into ENGLISH of "Systemidentifizierung des DFVLR-Forschungsflugzeugs HFB 320 in der Laengsbewegung mit besonderer Beruecksichtigung der Steuerflaechenwirksamkeit" Rept. DFVLR-Mitt-79-66 DFVLR, Brunswick, Jul. 1979 Original report in GERMAN previously announced as N81-13971
(ESA-TT-666; DFVLR-Mitt-79-16) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 12

Analysis of the longitudinal motion of the DFVLR HFB-320 research aircraft by means of a maximum likelihood method is described. The control surface effectiveness of separately or simultaneously deflected DLC flaps and spoilers was determined. The flight test technique, and the influence of different mathematical models on the results obtained, are illustrated and discussed. Author (ESA)

N82-10046# European Space Agency, Paris (France).
A CONTRIBUTION TO THE STABILIZATION OF FLIGHT VEHICLE PARACHUTE SYSTEMS
Christos Saliaris and Dieter Muenscher Jun. 1981 30 p refs Transl. into ENGLISH of "Beitraq zur Stabilisierung von Flugkoerper-Fallschirm-Systemen" Rept. Mitt-80-05 DFVLR, Brunswick,

Apr. 1980

(ESA-TT-679; DFVLR-Mitt-80-06) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 8.30

The dynamic behavior of a parachute-load system moving in a plane is analyzed. A mathematical model is adopted and a system of nonlinear equations of motion is produced, which are then solved without linearization using a digital computer. Calculations are carried out using a modified guide surface parachute in order to investigate the effects of parachute size, distance between attachment point and canopy, and distance between the attachment point and the center of gravity of the load on the oscillation of the missile. Parameters influencing the variation of the pitch angle of the load with time are also studied. Increasing the canopy and moving the attachment point behind the center of gravity of the load results in better stabilization. The damping increases, i.e. the pitch angle of the load becomes smaller and the period of oscillation decreases. If the distance between the attachment point on the load and the center of the canopy base is varied, there is scarcely any detectable change to the period of oscillation. However, the damping is influenced by a change in this distance; it has a maximum when the distance is approximately that which is customarily used. Author (ESA)

N82-10047# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Abteilung Elastomechanik und Aeroelastische Stabilitaet.

A METHOD FOR DETERMINATION OF THE AEROELASTIC BEHAVIOR OF AIRCRAFT WITH ACTIVE CONTROL SYSTEMS Ph.D. Thesis - Tech. Univ. Carolo-Wilhelmina

Raymond Freymann Feb. 1981 128 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-719)

(DFVLR-FB-81-06) Avail: NTIS HC A07/MF A01; DFVLR, Cologne DM 26.30

An analytical method for the performance of dynamic calculations on servocontrolled aircraft, based on an extended formulation of the generalized aeroelastic equations is presented. The additional parameters introduced in the extended equations of motion are determined experimentally in a ground vibration test performed on a real aircraft structure as well as with help from an experimental-analytical method for determination of the transfer functions of the hydraulic actuators. The elaborated method is shown satisfactory by comparison of measured and calculated data resulting from investigations performed on a model wing structure with a rudder driven by a hydraulic actuator. Author (ESA)

N82-10048# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

MULTI-VARIABLE ANALYSIS AND DESIGN TECHNIQUES

Sep. 1981 168 p refs Presented at a Lecture Series held at Ankara, 28-29 Sep. 1981, Bolkesjo, Norway, 1-2 Oct. 1981, and Delft, The Netherlands, 5-6 Oct. 1981

(AGARD-LS-117) Avail: NTIS HC A08/MF A01

The basic theories and concepts involved in the design of advanced guidance and control systems employing state-space and multi-variable design methods are explained. The main topics reviewed include: (1) analysis and synthesis techniques; (2) application of observer and estimation principles; (3) computer-aided design and analysis methods; (4) system simulation techniques; and (5) tests evaluation and validation.

N82-10049# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

THE NEED FOR MULTIVARIABLE DESIGN AND ANALYSIS TECHNIQUES

Rhall E. Pope *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 10 p

Avail: NTIS HC A08/MF A01

Demand for higher accuracy, improved reliability/survivability, and more automation are placing increased emphasis on the control function for successful operation of aircraft weapon systems. Modifications to airframe designs directed at increased maneuverability and reduced weight are placing stringent on flight control systems. Fly-by-wire systems, particularly digital systems, provide the flexibility to not only accommodate but influence airframe design modifications and led to the control configured vehicle (CCV) concept. These advances in air, vehicle design and flight control system implementation are overwhelming traditional design and analysis techniques. Stability and control design specification are inadequate in dealing with statistically unstable vehicles, multiple control loops and high dynamic coupling. Better control system design and analysis techniques are needed which address the multi-input closely coupled dynamic nature of today's and tomorrows aircraft weapon systems. A.R.H.

N82-10050# Cambridge Univ. (England). Dept. of Engineering.

CHARACTERISTIC AND PRINCIPAL GAINS AND PHASES AND THEIR USE AS MULTIVARIABLE CONTROL DESIGN TOOLS

Alistair G. J. MacFarlane *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 34 p refs

Avail: NTIS HC A08/MF A01

The key to the generalization of classical frequency-response design techniques to the multivariable case lies in the development of ways of suitably extending the concepts of gain and phase. It is shown how algebraic function theory can be used to generalise Nyquist diagram and Root-Locus diagram techniques for use with systems having many inputs and outputs. This is done in such a way that the main structural features of such diagrams can be related to state-space model parameters. The shortcomings of characteristic gains and phases (used in a generalised Nyquist approach) are then noted. An alternative way of introducing amplitude and phase information, via the polar decomposition of an operator, leads to the introduction of principal gains and principal phases. Their properties are examined and, in particular, it is shown how they may be used to characterise robustness. The use of these techniques for design purposes is discussed. A.R.H.

N82-10051# Honeywell Systems and Research Center, Minneapolis, Minn.

MULTIVARIABLE DESIGN TECHNIQUES BASED ON SINGULAR VALUE GENERALIZATIONS OF CLASSICAL CONTROL

John C. Doyle *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 15 p refs

Avail: NTIS HC A08/MF A01

Singular value analysis was used to generalize the fundamental feedback ideas from classical single loop control theory to multiloop systems. The classical view of measuring the benefit of feedback in terms of desensitizing the system to plant variations and disturbances is discussed. Uncertainty is shown to play a critical role in determining the way in which feedback may be used. Certain singular value plots, called sigma-plots, are introduced as natural and effective generalizations of Bode gain plots and form the basic tools for analysis of multiloop feedback systems. These tools provide reliable means for assessing the stability margins, bandwidth, and desensitizing effects of multiloop feedback systems. Examples of a two input oscillator and control of the rotors of the CH-47 helicopter are given to illustrate the use of the sigma-plots and their interpretations. A.R.H.

N82-10052# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

LIMITATIONS ON ACHIEVABLE PERFORMANCE OF MULTIVARIABLE FEEDBACK SYSTEMS

John C. Doyle *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 9 p refs

Avail: NTIS HC A08/MF A01

The design tradeoffs that are the focus of classical single-loop theory were generalized to multiloop systems using singular value analysis techniques. The first tradeoff is algebraic between large loop gain for good sensitivity properties and small loop gain for stability margins. Another is the functional tradeoff improsed by the Bode gain/phase relations. These tradeoffs impose limitations on the achievable performance of any feedback design. The limitations caused by nonminimum phase zeros are also discussed. The problem of directionality in multiloop systems has no analog in single loop feedback systems is presented and analyzed. A.R.H.

N82-10053# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

LOG-BASED MULTIVARIABLE DESIGN: FREQUENCY DOMAIN INTERPRETATION

Gunter Stein *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 9 p refs

Avail: NTIS HC A08/MF A01

The use of the Linear-Quadratic-Gaussian (LQG) methodology in designing feedback compensators which meet multivarible performance, stability, and stability robustness requirements expressed as singular value conditions in the frequency domain is demonstrated. A.R.H.

N82-10054# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

LQG MULTIVARIABLE DESIGN TOOLS

Gunter Stein and Stephen Pratt *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 16 p refs

Avail: NTIS HC A08/MF A01

The basic design algorithms needed for frequency domain oriented Linear-Quadratic-Gaussian feedback design are described and experimental interactive computer aided design package through which these algorithms can be effectively acessed is introduced. The algorithms and design package are illustrated with several flight control design examples for highly maneuverable aircraft. A.R.H.

N82-10055# Groningen Rijksuniversiteit (Netherlands). Mathematics Inst.

DESIGN OF HIGH INTEGRITY MULTIVARIABLE CONTROL SYSTEMS

J. C. Williams *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 10 p refs

Avail: NTIS HC A08/MF A01

The notions of (almost) controlled and conditionally invariant subspaces of linear systems are explained and their application to the synthesis of feedback compensators for disturbance rejection and to robust controller is outlined. The disturbance rejection and the robust controller design problems are viewed as a procedure for designing a high integrity feedback control system. A.R.H.

N82-10056# Toronto Univ. (Ontario). Systems Control Group.

A GEOMETRIC APPROACH TO MULTIVARIABLE CONTROL SYSTEM SYNTHESIS

W. Murray Wonham *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 21 p refs

Avail: NTIS HC A08/MF A01

Multivariable control is discussed with emphasis on Multivariable Control: fundamentals, disturbance decoupling and output stabilization, controllability subspaces, noninteracting control, and regulation and tracking in linear systems and structurally stable nonlinear regulation with step inputs. A version of the internal model principle for controlled sequential machines is included. A.R.H.

N82-10057# McGill Univ., Montreal (Quebec). Dept. of Electrical Engineering.

MULTIVARIABLES DESIGN: THE OPTIMIZATION OF APPROXIMATE INVERSES

G. Zames *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 6 p refs

Avail: NTIS HC A08/MF A01

A mathematical framework for the analysis of sensitivity in multi-input-multi-output linear feedback systems is proposed, based on the concepts of a multiplicative seminorm and an approximate inverse. Many of the empirical results of classical control theory pertaining to the use of lead-lag networks can be deduced in this framework as solutions to well-posed mathematical optimization problems. Moreover, new classes of optimal filters for the reduction of sensitivity are introduced. A definition of optimal sensitivity to plant uncertainty is established. The multiplicative property of seminorms is used to obtain the following principle: for any specified aposteriori accuracy, there is a maximum of apriori plant uncertainty that can be tolerated, and a minimum of identification that is required. Author

N82-10058# McGill Univ., Montreal (Quebec). Dept. of Electrical Engineering.

FEEDBACK AND MINIMAX SENSITIVITY

George Zames and Bruce A. Francis (Waterloo Univ.) *In* AGARD Multi-Variable Analysis and Design Tech. Sep. 1981 8 p refs Sponsored in part by National Science and Engineering Research Council of Canada

(Grant NSF ECS-80-12-565)

Avail: NTIS HC A08/MF A01

Feedbacks that minimize the sensitivity function of a linear, single variable feedback system represented by its frequency responses were considered. Sensitivity is measured in a weighted H (infinity) norm. The single variable cases are studied. The results are extended to unstable plants, and explicit formulas for the general situation of a finite number of RHP plant zeros or poles are provided. The Q or 'approximate-inverse' parameterization of feedbacks that maintain closed-loop stability is extended to the case of unstable plants. The H (infinity) and Wiener-Hopf approaches are compared. A.R.H.

N82-10060*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

EVALUATION OF THE ACOUSTIC MEASUREMENT CAPABILITY OF THE NASA LANGLEY V/STOL WIND TUNNEL OPEN TEST SECTION WITH ACOUSTICALLY ABSORBENT CEILING AND FLOOR TREATMENTS Final Report

Mark A. Theobald May 1978 46 p refs

(Contract NAS1-14611)

(NASA-CR-165796; Rept-3820) Avail: NTIS HC A03/MF A01 CSCL 14B

The single source location used for helicopter model studies was utilized in a study to determine the distances and directions upstream of the model accurate at which measurements of the direct acoustic field could be obtained. The method used was to measure the decrease of sound pressure levels with distance from a noise source and thereby determine the Hall radius as a function of frequency and direction. Test arrangements and procedures are described. Graphs show the normalized sound pressure level versus distance curves for the glass fiber floor treatment and for the foam floor treatment. A.R.H.

N82-10062# Committee on Science and Technology (U. S. House).

AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1981, PART 1

Washington GPO 1981 56 p Rept. to accompany H. R. 2643 Presented by the Comm. on Sci. and Technol. at the 97th Congr., 1st Sess., 19 Mar. 1981

(GPO-76-241-Pt-1) Avail: US Capitol, House Document Room

A bill authorizing appropriations to the FAA in the amount of $85,000,000 for air traffic control, navigation, aviation weather, aviation medicine, and ATC computer modernization for FY-1981-1982 is presented. The Committee directs that funds be reprogrammed to permit completion of the Flight Level 290 and to expedite development of the Doppler weather radar (Nexrad). The request for a trust fund to support $19.81 million of regulatory support research and development was denied. A.R.H.

N82-10063# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

AIR-BREATHING ENGINE TEST FACILITIES REGISTER

Joachim H. Krengel, comp. Jul. 1981 122 p

(AGARD-AG-269) Avail: NTIS HC A06/MF A01

A register was compiled, aimed at comprising the test facilities relevant for research and development in NATO countries. Included are test facilities being in use or under construction at the various research organizations, industrial firms, and universities. Test facilities and their technical data are given as far as the response to a questionnaire was received or open literature was available. Test engineers will be able to find whether a test facility suiting their specific demands already exists or may be easily adapted to their purposes. T.M.

N82-10107# European Space Agency, Paris (France).

FLIGHT TEST RESULTS OF THE MODEL SIMULATION CONTROLLER FOR THE HFB 320 FOR IN-FLIGHT SIMULATION OF THE A310 AIRBUS

Hans-Heinz Lange Apr. 1981 72 p refs Transl. into ENGLISH of 'Flugerprobung des modellfolgereglers fuer die HFB 320 zur Simulation des Airbus A 310 in Fluge" Rept. DFVLR-Mitt-79-13

DFVLR, Brunswick, 1979 Original report in GERMAN previously announced as N81-10078
(ESA-TT-680; DFVLR-Mitt-79-13) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 15.40

The onboard computer program which completes the model simulating control system is presented and its fundamental operations explained. The effect of nonlinearities is demonstrated by means of the results of ground simulation of the test aircraft, the control system and the simulated aircraft. The flight test results show the achieved quality of in-flight simulation of the modeled A310 aircraft. Examples of the ground simulation predictions of the overall aircraft and controller system behavior are cited. Author (ESA)

N82-10254# KVB, Inc., Irvine, Calif.
BASELINE DATA ON UTILIZATION OF LOW-GRADE FUELS IN GAS TURBINE APPLICATIONS. VOLUME 3: EMISSIONS EVALUATION Final Report
T. Sonnichsen Jun. 1981 108 p refs Sponsored in part by Electric Power Research Inst.
(EPRI Proj. 1079-3)
(DE81-903764; EPRI-AP-1882-Vol-3) Avail: NTIS HC A06/MF A01

A series of field tests was conducted on two residual-oil-fired gas turbine/heat recovery steam generators (HRSG) comprising a Westinghouse PACE 260-MW combined-cycle unit. Base load emission levels were determined. A series of tests was also made at reduced operating loads. Emission measurements included: (1) gaseous constituents measured by continuous monitoring instrumentation (O2, CO2, NO, NO sub x, and SO2) and by wet chemistry methods (SO3, aldehydes, and chlorides); and (2) particulate characteristics (mass loding, smoke spot number; submicron particle size, and particle morphology). Corrected NO sub x emissions at base load were 170 ppM and 200 ppM with and without HRSG afterburners in service, respectively. The NO sub x emissions decreased with water injection by 50% and were unchanged with the turbine wash. The NO sub x increased with load. DOE

N82-10286*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SYNTHETIC APERTURE RADAR TARGET SIMULATOR Patent Application
Howard A. Zebker (JPL, California Inst. of Technology, Pasadena), Daniel N. Held (JPL, California Inst. of Technology, Pasadena), Richard M. Goldstein (JPL, California Inst. of Technology, Pasadena), and Thomas C. Bickler, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 17 Jul. 1981 15 p
(Contract NAS7-100)
(NASA-Case-NPO-15024-1; US-Patent-Appl-SN-284287) Avail: NTIS HC A02/MF A01 CSCL 17I

A simulator for simulating the radar return, or echo, from a target seen by a SAR antenna mounted on a platform moving with respect to the target is described. It includes a first-in first-out memory which has digital information clocked in at a rate related to the frequency of a transmitted radar signal and digital information clocked out with a fixed delay defining range between the SAR and the simulated target, and at a rate related to the frequency of the return signal. An RF input signal having a frequency similar to that utilized by a synthetic aperture array radar is mixed with a local oscillator signal to provide a first baseband signal to provide a first baseband signal having a frequency considerably lower than that of the RF input signal. T.M.

N82-10326# Boeing Military Airplane Development, Seattle, Wash. Mechanical/Electrical Systems Technology Dept.
ADVANCED AIRCRAFT ELECTRICAL SYSTEM CONTROL TECHNOLOGY DEMONSTRATOR. PHASE 1: REQUIREMENTS ANALYSIS AND CONCEPTUAL DESIGN Interim Technical Report, 1 Sep. 1980 - 28 Feb. 1981
G. L. Dunn, P. J. Leong, and I. S. Mehdi Jul. 1981 103 p refs
(Contract F33615-80-C-2004; AF Proj. 3145)
(AD-A103922; D180-25927-2; AFWAL-TR-81-2068) Avail: NTIS HC A06/MF A01 CSCL 09/3

In Task 1, the requirements for the electrical power system and the integrated power system control were defined. In Task 2, three conceptual designs for the electrical power system were prepared. Each design incorporated a different data bus architecture, integrated, hierarchical, and non-integrated dedicated. The three designs were evaluated for application to a two engine tactical aircraft. Processor and data bus loading were examined for each architecture. Based on the evaluation, the conceptual design based on the integrated architecture is recommended for preliminary design in Task 3, phase I. Author (GRA)

N82-10421# Shock and Vibration Information Center (Defense), Washington, D. C.
THE SHOCK AND VIBRATION DIGEST, VOLUME 13, NO. 9
Judith Nagle-Eshleman, ed. Sep. 1981 123 p refs
(AD-A105062) Avail: SVIC, Code 5804, Naval Research Lab., Washington, D.C. 20375; $15.00/set CSCL 20/11

Structural dynamic problems inherent to design, analysis, and operation of rotating machinery were investigated. The following Space Shuttle related problems are discussed: analytical and experimental loads, and dynamics efforts; development of data systems and environmental testing programs; Space Shuttle thermal protection system and the Space Shuttle main engine: structural dynamics, dynamic testing, and vibration control.

N82-10452# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastic.
CALCULATION OF NATURAL MODES OF VIBRATION FOR ROTOR BLADES BY THE FINITE ELEMENT METHOD
Fritz Kiessling and Dieter Ludwig Jan. 1981 66 p refs In GERMAN; ENGLISH summary
(DFVLR-FB-81-07) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 14,20

The mass and stiffness matrices for a rotating blade are established by the finite element method. The formulation is based on the Lagrange function presented for combined flapwise bending, chordwise bending, and torsion of twisted nonuniform rotor blades. The element matrices were created by the nonnumeric computer program REDUCE by which it is possible to evaluate the formulas by symbolic manipulation. An ordering scheme was introduced to demonstrate which terms were simplified or neglected. As examples, eigenanalyses are performed for a nonrotating homogeneous beam and for the rotor blade of a wind energy converter. Author (ESA)

N82-10512# Hope Associates, Inc., Washington, D.C.
A COMPREHENSIVE BIBLIOGRAPHY OF LITERATURE ON HELICOPTER NOISE TECHNOLOGY Final Report
A. M. Carter, Jr. Jun. 1981 116 p
(Contract DTFA01-80-Y-10597)
(AD-A103331; FAA-EE-81-4) Avail: NTIS HC A06/MF A01 CSCL 20/1

This bibliography, covering the period 1975 through calender 1980 also provides abstracts on literature that appear to make a significant contribution to the field of helicopter noise technology. The helicopter is recognized as a complex noise generator, with significant contributions from the rotors, the engine and the gearbox. Progress continues to be made in the noise areas of: (a) Formulations, math models and analytical procedures; (b) Noise prediction methodology; (c) Noise reduction techniques; and (d) Subjective response to helicopter noise. The body of information, data and knowledge has use in many applications, including the reduction of helicopter noise in a cost effective manner and in minimizing annoyance to the civil populace. GRA

N82-10588# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1982: INDEX
Washington GPO 1981 316 p Hearings on H.R. 1257 before the Comm. on Sci. and Technol., 97th Congr., 1st Sess., No. 2, 1981
(GPO-84-712) Avail: Committee on Science and Technology

A subject and name index is presented to the testimony delivered, statements received, and questions raised in relation to NASA's budget requests, for program management, construction of facilities, and research and development. A.R.H.

N82-10661# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
FINITE DIFFERENCE COMPUTATION OF THE STEADY TRANSONIC POTENTIAL FLOW AROUND AIRPLANES

Luo Shijun, Zheng Yuwen, Qian Hong, and Wang Dieqian *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 5-30 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

The velocity potential equation was approximated by assuming that the perturbation velocity component in the transverse plane of the body is much smaller than the undistributed flow velocity, while the perturbation velocity component in the longitudinal direction may not be so. It was then solved with mixed schemes of finite differences. The boundary condition on wings (tails) and its wake were approximated similarly. Two numerical examples are included and the results agree well with known wind tunnel test results. T.M.

N82-10982# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

SECOND ORDER APPROXIMATION THEORY OF AN ARBITRARY AEROFOIL IN COMPRESSIBLE POTENTIAL FLOW

Lin Chaoqiang *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 31-50 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

The region outside an arbitrary airfoil is conformally transformed into the region outside a unit circle. The transformation functions are expanded into ascending power series and then only those terms up to and including the second order are retained. The resulting formulae are given analytically. The method is nearly an exact solution from the engineering point of view, even for an airfoil with thickness as much as 30 percent of the chord and with maximum camber as much as 10 percent of the chord. T.M.

N82-10983# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

AERODYNAMIC CALCULATIONS AND DESIGN OF SUBCRITICAL AEROFOILS

Lin Chaoqiang *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 51-64 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

A method of calculating the velocity and pressure distribution on an airfoil of given geometrical profile at a given angle of attack in subcritical potential flow is described. Inversely, designing appropriate airfoil geometry and the corresponding angle of attack for a given pressure distribution is discussed. T.M.

N82-10984# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

AN AERODYNAMIC DESIGN METHOD FOR TRANSONIC AXIAL FLOW COMPRESSOR STAGE

Zhu Fangynan, Zhou Xinhai, Liu Songling, and Fan Feida *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 65-86 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

The method is comprised of three main parts: the mean S sub 2 streamsurface calculation, the approximate calculation of S sub 1 streamsurface of revolution, and defining the blade element on the conical surface and stacking the blade airfoil sections. The method is unusual in that the calculation stations for making the S sub 2 streamsurface computations are curves, and particularly in that the airfoil parameters of blade are calculated on a plane tangent to the approximate streamsurface of revolution. On this tangential plane, two dimensional flow is used as basic model to calculate the Mach wave system on the suction surface of cascade entrance region. T.M.

N82-10994# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THE AUTOMATIC MATRIX FORCE METHOD AND TECHNIQUES FOR HANDLING MORE COMPLEX COMPUTATIONS WITH GIVEN COMPUTER CAPACITY

Yang Qingxiong *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 338-358 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

The history of using the method for structural computation in domestic aeronautical engineering was reviewed. The development and application of the matrix method was examined. T.M.

N82-10995# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

STRUCTURAL ANALYSIS OF FUSELAGES WITH CUTOUTS BY FINITE ELEMENT METHOD

G. Shoulian, Sun Can, Tang Xuunchun, and Ye Tiangi *In its* Recent Selected Papers of NW Polytech. Univ., pt. 1 (FTD-ID(RS)T-0259-81-Pt-1) 20 Aug. 1981 p 359-378 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 1 (Xian Shaanxi), 1979

Avail: NTIS HC A17/MF A01

The rear part of a transport aircraft's fuselage was studied. It consists of two sections, the front section being a closed cylinder with a floor and the other section containing a large cutout. An idealized structure is considered to have 1950 degrees of freedom. In this analysis, three kinds of finite element were adopted: a flange element with various cross sections; a constant shear flow quadrilateral of arbitrary shape; and a beam element of various cross sections taking account of eccentricity of the nodes from the axes of moment and inertia. A factorization algorithm was adopted in the solution of the system of linear algebraic equations. T.M.

N82-10998# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

MATRIX ANALYSIS OF WINGS

Xu Yuan, Zhu Runziang, Jiang Jinqiag, and Cai Yiuliu *In its* Recent Selected Papers of NW Polytech. Univ., pt. 2 (FTD-ID(RS)T-0260-81-Pt-2) 28 Aug. 1981 p 76-111 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 2 (Xian Shaanxi), 1979

Avail: NTIS HC A18/MF A01

The plate-beam wing constructions are simplified either as plane stress or plate bending models. The triangular element matrix of a laminated plate is introduced as well as the element stiffness matrix of the beam of axially variable rectangular cross section. Two general computer calculation programs are also compiled. Calculations are shown for wings consisting of plates and beams, honeycomb core and solid wings. Compared to the experimental results, the errors in the nodal deflections are generally less than 5%. It is clear that the method adopted has finite accuracy and generality. R.C.T.

N82-11006# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

INITIAL EXPERIMENTAL RESEARCH INTO THE RESPONSE OF TURBOJET ENGINE COMPRESSORS TO DISTORTION OF INTAKE PRESSURE

Chen Fu-qun, Tang Di-yi, Hu Zi-long, Id Wen-lan, Yu Jin-di, Wu Xin-yuan, Zhao Jue-liang, Lin Qi-xun, Wang Zong-yuan, Liu Si-hong et al *In its* Recent Selected Papers of NW Polytech. Univ., pt. 2 (FTD-ID(RS)T-0260-81-Pt-2) 28 Aug. 1981 p 287-316 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 2 (Xian Shaanxi), 1979

Avail: NTIS HC A18/MF A01

The influence which distorations in intake pressure have on the stability and characteristics of the compressors of turbojet engines was investigated. The test bed of a turbojet engines with a nine stage compressor was used as a test bed. The first stage of the compressor was transonic. It was concluded that the capabilities of compressors of this type of turbojet engine are not only determined by the capabilities or characteristics of the compressor but also by the structural arrangement and actual situation of the other components in system of the compressor. Other significant conclusions are reported. R.C.T.

N82-11007# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

A PRELIMINARY EXPERIMENTAL INVESTIGATION OF THE RESPONSE OF A TURBOJET ENGINE TO INLET PRESSURE DISTORTION

Chen Fu-qun, Tang Di-yi, Hu Zi-long, Id Wen-lan, Yu Jin-di, Wu Xin-yuan, Zhao Jue-liang, Lin Qi-xun, Wang Zong-yuan, and Liu Si-hong *In its* Recent Selected Papers of NW Polytech. Univ., pt. 2 (FTD-ID(RS)T-0260-81-Pt-2) 28 Aug. 1981 p 317-346 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 2 (Xian Shaanxi), 1979

Avail: NTIS HC A18/MF A01

Preliminary experimental results about the effect of inlet pressure distortion on the characteristics and instability of the axial compressor of a turbojet engine are presented. The experiments were conducted on the test bed on a turbojet engine with a 9-stage compressor, whose first stage is transonic. The tests were run for each of the following cases: (1) at 90% design speed with 180 deg triple-deck 36 mesh screen in front of the engine inlet, i.e., 3x36 mesh; (2) at 90% design speed with 180 deg single-deck 35 mesh screen, i.e., 1x36 mesh; (3) at 90% design speed with clean inlet; and (4) at 87% design speed with a decrease of about 12% of the first stage turbine nozzle exit area. R.C.T.

N82-11008# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

AN EXPERIMENTAL INVESTIGATION OF THE ROTATING STALL, SURGE AND WAKE BEHIND THE ROTOR FOR A SINGLE STAGE AXIAL COMPRESSOR

Zhang Weide, Zhang Changsheng, Liu Zhiwei, and Liu Jiafeng *In its* Recent Selected Papers of NW Polytech. Univ., pt. 2 (FTD-ID(RS)T-0260-81-Pt-2) 28 Aug. 1981 p 347-370 refs Transl. into ENGLISH from Recent Selected Papers of NW Polytech. Univ., pt. 2 (Xian Shaanxi), 1979

Avail: NTIS HC A18/MF A01

Dynamic tests were conducted in order to investigate the rotating stall, surge, and wake behind the rotor of a single stage axial compressor. The relationship between the rotating stall and the total turbulence behind the rotor caused by the wake was also studied. It was found that the waveform of the wake behind the rotor shows marked changes when rotating stall approaches. The wake induced degree of total turbulence increases sharply, and therefore may be used as a way to predict rotating stall. The total process of rotating stall and surge as well as the differences between the two and their connection were also compared. R.C.T.

N82-11013*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECTS OF VORTEX FLAPS ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF AN ARROW WING

Long P. Yip and Daniel G. Murri Nov. 1981 84 p refs (NASA-TP-1914; L-14575) Avail: NTIS HC A04/MF A01 CSCL 01B

Tests were conducted in the Langley 12-foot low-speed wind-tunnel to determine the longitudinal and lateral-directional aerodynamic effects of plain and tabbed vortex flaps on a flat-plate, highly swept arrow-wing model. Flow-visualization studies were made using a helium-bubble technique. Static forces and moments were measured over an angle-of-attack range from 0 deg to 50 deg for sideslip angles of 0 deg and + or - 4 deg. A.R.H.

N82-11014# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technol. Div.

ACTA MECHANICA SINICA

11 Sep. 1981 47 p refs Transl. into ENGLISH from Acta Mech. Sinica (China), no. 1, 1979 70-73 (AD-A105184; FTD-ID(RS)T-0704-81) Avail: NTIS HC A03/MF A01 CSCL 01/2

Various fluid dynamics problems are discussed including the computation of three-dimensional flow in turbomachinery, the design of wing root regions of aircraft wing-body combinations, and the diffraction and reflection of traveling shock waves.

N82-11015# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THE ARBITRARY QUASI-ORTHOGONAL SURFACE METHOD FOR COMPUTING THREE-DIMENSIONAL FLOW IN TURBINE MACHINERY. 2. CALCULATION OF THE THREE-DIMENSIONAL FLOW WITH THE S SUB 1-SURFACE TWISTED

Xin Xiao-Kang, Jiang Jin-Liang, and Zhu Shi-Can *In its* Acta Mech. Sinica (FTD-ID(RS)T-0704-81) 11 Sep. 1981 p 1-19 refs Transl. into ENGLISH from Acta Mech. Sinica (China), no. 1, 1979

Avail: NTIS HC A03/MF A01 CSCL 01/2

On the basis of the quasi-orthogonal surface method, a three-dimensional flow field solution of inviscous fluids in turbine machinery is obtained. This method, under the condition allowed by the storage of the computer, can calculate any shapes of S sub 1 and S sub 2 surfaces (including twisting S sub 1 surfaces) and obtain the shapes of space streamlines and the three-dimensional distribution of parameters such as velocity. The calculations for the two conditions of a centrifugal compressor with a small impeller (phi 110) indicate the relative value of the twist of the S sub 1 surface is about 3 to 10 percent. The S sub 1 surface shows a double twist like a twist drill from the inlet to the outlet. M.G.

N82-11016# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THE PRINCIPLES AND METHODS FOR SHAPING THE WING ROOT REGIONS OF A WING-BODY COMBINATION AT TRANSONIC AND LOWER SUPERSONIC SPEEDS

Yang Tso Sheng, Tai Chia Tsun, Chen Ching Sung, and Fan I. Chia *In its* Acta Mech. Sinica (FTD-ID(RS)T-0704-81) 11 Sep. 1981 p 20-35 refs Transl. into ENGLISH from Acta Mech. Sinica (China), no. 1, 1979

Avail: NTIS HC A03/MF A01 CSCL 01/2

The principles and methods for the combined shaping of the wing root regions of a wing-body combination, in accordance with the requirements of area rule and shockless pressure field, are discussed. It is shown that the favorable non-midwing arrangement is able to reduce the amount of fuselage shaping required for the reduction of the zero lift wave drag of a wing-body combination. The combined shaping so designed may thus be realized more easily in structural arrangement. M.G.

N82-11024# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THEORETICAL INVESTIGATIONS AND EXPERIMENTAL RESEARCHES FOR HIGHER SUBSONIC TWO-DIMENSIONAL COMPRESSOR CASCADE

Yen Ru-qun and Qian Zhao-yan *In its* J. of Eng. Thermophys. (Selected Articles) (FTD-ID(RS)T-0570-81) 16 Sep. 1981 p 1-34 refs Transl. into ENGLISH from Gongcheng Rewuli Xuebao (China), v. 2, no. 1, Feb. 1981 Presented at the 3rd Ann. All-China Thermophys. Eng. Technol. Conf., Gui Lin, China, Apr. 1980

Avail: NTIS HC A05/MF A01 CSCL 21/5

Compressible turbulence flow boundary layer theory and several characteristic boundary layer parameters (momentum thickness, form factors, energy factors and other combinational parameters) were combined with simplified gas flow speed distributions in the boundary layers in the wake behind the blade cascade and used to deduce, on the basis of the research foundation accumulated in the past about the theory of blade cascade losses, a simplified equation for the calculation of total two-dimensional blade cascade pressure losses for subsonic and transonic speeds. With this equation, it is possible to calculate the two-dimensional blade cascade pressure losses in designed operational configurations and off-designed operational configurations. A graphical method for determining the corrected gas compressibility effect in the blade cascade of compressors under operating conditions involving higher subsonic and transonic speeds is also introduced. A.R.H.

N82-11025# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

A THEORETICAL ANALYSIS OF THE STREAM SURFACE OF REVOLUTION WITH SUPERSONIC INLET FLOW IN A TRANSONIC AXIAL COMPRESSOR

Xu Jian-zhong, Jiang Zuo-ren, Yang Jin-sheng, Zheng Ying, and Du Zhuan-she *In its* J. of Eng. Thermophys. (Selected Articles) (FTD-ID(RS)T-0570-81) 16 Sep. 1981 p 35-50 refs Transl. into ENGLISH from Gongcheng Rewuli Xuebao (China), v. 2, no. 1, Feb. 1981 Presented at the 3rd Ann. All-China Eng. Thermophys. and Technol. Conf., Gui Lin, China, Apr. 1980

Avail. NTIS HC A05/MF A01 CSCL 21/5

Changes in the gas flow velocity triangle behind the shock waves being considered were studied in an effort to analyze the effect which shock waves have on gas flow. A planar oblique relationship formula was used to deduce the corresponding values of changes in velocity moment, pressure losses, and total pressure ratios. This explains the important phenomenon involved when the supersonic intake cross section shock waves of transonic compressors cause addition pressurization of gas flow (supercharging). Aerodynamic and thermodynamic analyses and calculations were then carried out on the tip cross sections of the rotors. The characteristic curve calculations for the shock waves in front of the blade cascades and for the intake areas of these cascades are examined. Passageway shock waves are also calculated. Results are discussed. A.R.H.

N82-11027# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
A NEW METHOD OF COOLING TURBINE VANES
Gu Wei-zao, Zhang Yu-ming, and Xu Hong-kun *In its* J. of Eng. Thermophys. (Selected Articles) (FTD-ID(RS)T-0570-81) 16 Sep. 1981 p 65-71 refs Transl. into ENGLISH from Gongcheng Rewuli Xuebao (China), v. 2, no. 1, Feb. 1981 Presented at the 3rd Ann. All-China Eng. Thermophys. Technol. Conf., Gui Zhoy, China, Apr. 1980

Avail: NTIS HC A05/MF A01 CSCL 21/5

The combined use of an internal cooling process with strengthened blades and of additives to lessen heat transfer to the blades from fuel gasses is proposed as a means of increasing intake temperature in aircraft turbine engines. Topics covered include coarseness-strengthened heat exchange in the inner passageways of blades and the precipitation of silicon dioxide particles in fuel gases onto blade surfaces. Temperature calculations made for the first stage guide vanes of the MK202 engine are included. A.R.H.

N82-11033*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL RESULTS FOR A MODIFIED 17-PERCENT-THICK LOW-SPEED AIRFOIL SECTION
Robert J. McGhee and William D. Beasley Nov. 1981 87 p refs
(NASA-TP-1919; L-14666) Avail: NTIS HC A05/MF A01 CSCL 01A

Wind-tunnel tests were conducted in the Langley low-turbulence pressure tunnel to evaluate the effects on performance of modifying a 17-percent-thick low-speed airfoil. The airfoil contour was altered to reduce the pitching-moment coefficient by increasing the forward loading and to increase the climb lift-drag ratio by decreasing the aft upper surface pressure gradient. The tests were conducted over a Mach number range from 0.07 to 0.32, a chord Reynolds number range 1.0 x 10 to the 6th power to 12.0 x 10 to the 6th power, and an angle-of-attack range from about -10 deg to 20 deg. Author

N82-11034# National Aerospace Lab., Tokyo (Japan).
NEW ESTIMATION METHOD FOR FLUTTER OR DIVERGENCE BOUNDARY FROM RANDOM RESPONSES AT SUBCRITICAL SPEEDS
Yuji Matsuzaki and Yasukatsu Ando Apr. 1981 15 p refs
(NAL-TR-667T; ISSN-0389-4-10) Avail: NTIS HC A02/MF A01

A new technique for estimating the flutter or divergence boundary from responses due to turbulence at subcritical speeds is described. The boundary can be predicted without estimating or measuring the dampings and frequencies of the aeroelastic modes. The sampled time response is modeled by the mixed autoregressive moving average process. The orders and coefficients of both autogressive and moving average parts of the process are determined with the aid of Akaike's estimation procedure. The stability boundary is estimated by using Jury's stability determinants which are expressed in terms of the autogressive coefficients alone. The modal frequencies and dampings are also evaluated from the coefficients. The technique proposed has been applied with success to signals from a cantilever wing model tested in a low supersonic flow. Comparison between the actual and estimated flutter boundaries shows that an accurate estimation can be made from data obtained in a narrow range of the dynamic pressure which is sufficiently below the boundary. Author

N82-11035# National Aerospace Lab., Tokyo (Japan). First Airframe Div.
A STUDY ON NUMERICAL METHOD FOR EVALUATING SPANWISE INTEGRAL IN SUBSONIC LIFTING-SURFACE THEORY
Teruo Ichikawa Mar. 1981 22 p refs
(NAL-TR-661T; ISSN-3989-4010) Avail: NTIS HC A02/MF A01

Two disputable points are discussed. The first point is the coincidence of each collocation section with one of the spanwise integration points. The second point is the relatively small, but undesirable, sharp variation of the regularized influence functions near the collocation sections. Two proposals for coping with these difficulties are made. Their effects are examined by computing the downwash at the surface of a steady rectangular wing subjected to a simple wing loading. It is shown that method 1, which avoids the coincidence, makes it possible, with no losses in accuracy, to greatly reduce the computing time in cases of oscillating wings. Further, it is shown that remarkable improvement in convergence with respect to the number of spanwise integration points is obtained by method 2 which distributes the spanwise integration points densely only near the collocation sections. T.M.

N82-11039*# North Carolina State Univ., Raleigh. Center for Sound and Vibration.
AIRCRAFT WING TRAILING-EDGE NOISE
Ronald L. Underwood and Thomas H. Hodgson 1981 145 p refs
(Grant NsG-1377)
(NASA-CR-164952) Avail: NTIS HC A07/MF A01 CSCL 01A

The mechanism and sound pressure level of the trailing-edge noise for two-dimensional turbulent boundary layer flow was examined. Experiment is compared with current theory. A NACA 0012 airfoil of 0.61 m chord and 0.46 m span was immersed in the laminar flow of a low turbulence open jet. A 2.54 cm width roughness strip was placed at 15 percent chord from the leading edge on both sides of the airfoil as a boundary layer trip so that two separate but statistically equivalent turbulent boundary layers were formed. Tests were performed with several trailing-edge geometries with the upstream velocity U sub infinity ranging from a value of 30.9 m/s up to 73.4 m/s. Properties of the boundary layer for the airfoil and pressure fluctuations in the vicinity of the trailing-edge were examined. A scattered pressure field due to the presence of the trailing-edge was observed and is suggested as a possible sound producing mechanism for the trailing-edge noise. T.M.

N82-11042*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW SPEED TESTING OF THE INLETS DESIGNED FOR A TAMDEN-FAN V/STOL NACELLE
Robert C. Williams and Andres H. Ybarra (Vough Corp., Dallas) 1981 13 p refs Presented at the V/STOL Conf., Palo Alto, Calif., 7-9 Dec. 1981
(NASA-TM-82728; E-1031; AIAA-81-2627) Avail: NTIS HC A02/MF A01 CSCL 01A

An approximately 0.25 scale model of a tandem fan nacelle, designed for a subsonic V/STOL aircraft, was tested in a Lewis wind tunnel. Model variables included long and short aft inlet cowls and the addition of exterior strakes to the short inlet cowl. Inlet pressure recoveries and distortion were measured at pitch angles to 40 deg and at combinations of pitch and yaw to 30 deg. Airspeeds covered a range to 135 knots (69 m/sec). The short aft inlet with added strakes had the best aerodynamic performance and is considered suitable for the intended V/STOL application. T.M.

N82-11043*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A SUMMARY OF V/STOL INLET ANALYSIS METHODS
Danny P. Hwang 1981 12 p refs Presented at the V/STOL Conf., Palo Alto, Calif., 7-9 Dec. 1981
(NASA-TM-82725; E-1027) Avail: NTIS HC A02/MF A01 CSCL 01A

Recent extensions and applications of the methods are emphasized. They include the specification of the Kutta condition for a slotted inlet, the calculation of suction and tangential blowing for boundary layer control, and the analysis of auxiliary inlet geometries at angles of attack. A comparison is made with experiment for the slotted inlet. An optimum diffuser velocity distribution was developed. T.M.

N82-11046*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPUTATION OF HIGH REYNOLDS NUMBER INTERNAL/EXTERNAL FLOWS
Michael C. Cline and Richard G. Wilmoth 1981 12 p refs
Presented at the 5th AIAA Computational Fluid Dyn. Conf., Palo Alto, Calif., 22-23 Jun. 1981
(Contract W-7405-eng-36)
(NASA-TM-84049; DE81-025343; LA-UR-81-1882; CONF-810664-2) Avail: NTIS HC A02/MF A01 CSCL 01A

A general, user oriented computer program, called VNAP2, was developed to calculate high Reynolds number, internal/external flows. The VNAP2 program solves the two dimensional, time dependent Navier-Stokes equations. The turbulence is modeled with either a mixing-length, a one transport equation, or a two transport equation model. Interior grid points are computed using the explicit MacCormack Scheme with special procedures to speed up the calculation in the fine grid. All boundary conditions are calculated using a reference plane characteristic scheme with the viscous terms treated as source terms. Several internal, external, and internal/external flow calculations are presented. DOE

N82-11047# Federal Aviation Administration, Washington, D.C. Systems Research and Development Service.
THREAT ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) SYMPOSIUM
22 Jul. 1981 177 p refs Symp. held at Washington, D.C., 22 Jul. 1981
(AD-A104563; FAA-RD-81-76) Avail: NTIS HC A09/MF A01 CSCL 01/4

The Federal Aviation Administration held a symposium on Threat Alert and Collision Avoidance System (TCAS) in Washington, D.C., July 22, 1981, which was attended by representatives of 68 organizations and 21 airlines. This report contains the news release announcing the new approach to providing protection against mid-air collisions, 10 presentations and the transcript of the panel discussion. The TCAS will provide a range of capabilities and costs which will meet the requirements of all airspace users. The least complex part of the system is designed for private pilots and would cost about $2,500. The fully capable, or airline, version would cost between $45,000 and $50,000. This new concept represents a new capability which draws on all FAA has learned about collision avoidance in its past efforts, extends and simplifies FAA's efforts to date, provides new capabilities to all users, and is fully compatible with international standards and improvement activities on the Secondary Surveillance Radar (SSR). Author (GRA)

N82-11048# Lear Siegler, Inc., Grand Rapids, Mich. Instrument Div.
FLIGHT TRAJECTORY CONTROL INVESTIGATION Final Report, 15 May 1978 - 30 Oct. 1980
M. Bird and J. Karmarker Wright-Patterson AFB, Ohio AFWAL Mar. 1981 174 p refs
(Contract F33615-78-C-3607; AF Proj. 2403)
(AD-A104542; ID-05R-1180; AFWAL-TR-81-3012) Avail: NTIS HC A08/MF A01 CSCL 17/9

Optimal control algorithms for four-dimensional guidance of a transport aircraft were investigated for feasibility. Cost function constraints on the optimal reference path generator appeared impossible to achieve and the optimal guidance algorithms do not achieve significant performance improvement without excessive increases in sophistication and cost of the onboard avionics computer. A modularized existing Mission Management system allows a three-phase flight test plan to demonstrate the operational capability of the existing classical integrated flight trajectory control algorithms. Author (GRA)

N82-11049# General Accounting Office, Washington, D. C. Community and Economics Development Div.
FAA MISSES OPPORTUNITIES TO DISCONTINUE OR REDUCE OPERATING HOURS OF SOME AIRPORT TRAFFIC CONTROL TOWERS Report to the Congress
1 Jun. 1981 39 p
(PB81-224214; CED-81-100) Avail: NTIS HC A03/MF A01 CSCL 17G

FAA is not adequately surveying or evaluating air traffic levels at 24 hour control towers to identify opportunities to reduce operating hours and save money. GRA

N82-11050*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PARAMETRIC STUDY OF MICROWAVE-POWERED HIGH-ALTITUDE AIRPLANE PLATFORMS DESIGNED FOR LINEAR FLIGHT
Charles E. K. Morris, Jr. Nov. 1981 74 p refs
(NASA-TP-1918; L-14606) Avail: NTIS HC A04/MF A01 CSCL 01C

The performance of a class of remotely piloted, microwave powered, high altitude airplane platforms is studied. The first part of each cycle of the flight profile consists of climb while the vehicle is tracked and powered by a microwave beam; this is followed by gliding flight back to a minimum altitude above a microwave station and initiation of another cycle. Parametric variations were used to define the effects of changes in the characteristics of the airplane aerodynamics, the energy transmission systems, the propulsion system, and winds. Results show that wind effects limit the reduction of wing loading and the increase of lift coefficient, two effective ways to obtain longer range and endurance for each flight cycle. Calculated climb performance showed strong sensitivity to some power and propulsion parameters. A simplified method of computing gliding endurance was developed. S.L.

N82-11052*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TESTS OF A COMPOSITE POROUS LEADING EDGE FOR USE WITH A LIQUID ANTI-ICE SYSTEM
David L. Kohlman Sep. 1981 21 p refs
(Grant NAG3-71)
(NASA-CR-164966; KU-FRL-464-3) Avail: NTIS HC A02/MF A01 CSCL 01C

The efficacy of liquid ice protection systems which distribute a glycol-water solution onto leading edge surfaces through a porous skin was demonstrated in tests conducted in the NASA Lewis icing research tunnel using a composite porous leading edge panels. The data obtained were compared with the performance of previously tested stainless steel leading edge with the same geometry. Results show: (1) anti-ice protection of a composite leading edge is possible for all the simulated conditions tested; (2) the glycol flow rates required to achieve anti-ice protection were generally much higher than those required for a stainless steel panel; (3) the low reservoir pressures of the glycol during test runs indicates that more uniform distribution of glycol, and therefore lower glycol flow rates, can probably be achieved by decreasing the porosity of the panel; and (4) significant weight savings can be achieved in fluid ice protection systems with composite porous leading edges. The resistance of composite panels to abrasion and erosion must yet be determined before they can be incorporated in production systems. A.R.H.

N82-11053*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SELECTED BIBLIOGRAPHY OF NACA-NASA AIRCRAFT ICING PUBLICATIONS
John J. Reinmann, comp. Aug. 1981 127 p
(NASA-TM-81651; E-668) Avail: NTIS HC E15/MF A01 CSCL 01C

A summary of NACA-NASA icing research from 1940 to 1962 is presented. It includes: the main results of the NACA icing program from 1940 to 1950; a selected bibliography of 132 NACA-NASA aircraft icing publications; a technical summary of each document cited in the selected bibliography; and a microfiche copy of each document cited in the selected bibliography. T.M.

N82-11054*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A COMPARISON OF THEORETICAL AND EXPERIMENTAL PRESSURE DISTRIBUTIONS FOR TWO ADVANCED FIGHTER WINGS
H. P. Haney (Vought Corp., Dallas) and R. M. Hicks Oct. 1981 87 p refs
(NASA-TM-81331; A-8741) Avail: NTIS HC A05/MF A01 CSCL 01C

A comparison was made between experimental pressure distributions measured during testing of the Vought A-7 fighter and the theoretical predictions of four transonic potential flow codes. Isolated wind and three wing-body codes were used for comparison. All comparisons are for transonic Mach numbers and include both attached and separate flows. In general, the wing-body codes gave better agreement with the experiment than did the isolated wing code but, because of the greater complexity of the geometry, were found to be considerably more expensive and less reliable. Author

N82-11055# Computational Mechanics Consultants, Knoxville, Tenn.

A NUMERICAL THREE-DIMENSIONAL TURBULENT SIMULATION OF A SUBSONIC VSTOL JET IN A CROSS-FLOW USING A FINITE ELEMENT ALGORITHM Final Report, Sep. 1979 - Sep. 1980

A. J. Baker, J. A. Orzechowski, and P. D. Manhardt Jun. 1981 72 p refs
(Contract N62269-79-C-0295)
(AD-A104514; NADC-79021-60) Avail: NTIS HC A04/MF A01 CSCL 01/3

The purpose of this study, the results of which are reported herein, was to formulate a mathematical model of the basic VSTOL jet, and to validate its appropriateness by performing a series of computational experiments on the discrete analog (numerical) approximation to the mathematical description. Since the VSTOL jet problem is essentially steady, turbulent and fully three-dimensional, the mathematical description must be quite comprehensive. The approach selected was to utilize a continuity-constrained, finite element algorithm for solution of the parabolized form of the time-averaged, three-dimensional Navier-Stokes equations (3DPNS). The essential ingredients of this algorithmic description are presented and discussed. A production finite element computer code (COMOC:3DPNS) was utilized to conduct the computational experiments, and the description of problem definition and data deck preparation is contained at the end of the report. The key results of the computational experiments are discussed, regarding the basic causal mechanisms of the VSTOL jet, as well as results for confirmation test cases documenting viability of the constructed computational model. Author (GRA)

N82-11056# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

ROTORCRAFT ICING: STATUS AND PROSPECTS

Aug. 1981 136 p refs
(AGARD-AR-166; ISBN-92-835-1397-5) Avail: NTIS HC A07/MF A01

The impact of icing meteorological conditions on helicopter operations was examined, and methods for improving ice protection investigated.

N82-11057# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

OPERATIONAL ENVIRONMENT, METEOROLOGICAL CONDITIONS AND WEATHER FORECASTING

In its Rotorcraft Icing Aug. 1981 p 1-13 refs

Avail: NTIS HC A07/MF A01

Helicopter icing is a significant operational consideration for helicopters operating throughout Europe. Existing weather statistics demonstrate significant operational limitations during the winter months, and for as much as five percent of the time on a year-around basis. Unfortunately the existing meteorological data base is insufficient to describe the operating environment in which NATO rotorcraft must conduct flight. At present for design purposes, the United States Federal Air Regulation 25 Appendix C or the UK Icing Atmosphere are employed for determination of airworthiness release of helicopters. However, neither of these atmospheres adequately defines the operational environment. This condition is exacerbated by the fact that forecasting techniques are currently inadequate to allow unrestricted helicopter operations in icing conditions. Increased coordination among cloud physicists, forecasters, and helicopter icing specialists is needed - and ultimately a new icing atmosphere is required to better define the helicopter operational icing requirements. J.D.H.

N82-11058# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

TECHNOLOGY BASE FOR ICING INSTRUMENTATION AND MATHEMATICAL MODELLING

In its Rotorcraft Icing Aug. 1981 p 14-33 refs

Avail: NTIS HC A07/MF A01

The fundamental mechanisms of ice accretion and shedding from rotor airfoils are considered. It is felt that an opportunity exists to exploit a combination of two-dimensional model and three-dimensional model scale testing, measurement of ice release mechanisms, inclusion of heat transfer models, and consideration of icing simulation. These efforts should be aimed at development of analytical models verified by both laboratory and full-scale data which then can be used to better predict performance of rotors in icing conditions. Only with the above analytical basis can ice accretion and shedding characteristics become sufficiently predictable to permit the determination of what type of ice protection is necessary or, conversely, what degree of flight envelope release might be permitted with a given level of ice protection. Further improvement in research and development of operational icing sensors is recommended. J.D.H.

N82-11059# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

FACILITIES FOR DEVELOPMENT AND CLEARANCE

In its Rotorcraft Icing Aug. 1981 p 34-53

Avail: NTIS HC A07/MF A01

A catalog of all NATO icing test facilities was compiled. It is recommended that the Canadian National Research Council's small high speed icing tunnel is a one-of-a-kind facility that needs to be available to support analytical development recommended, and that the tunnel should be reactivated or replaced. A decision has been made to retain the Ottawa Spray Rig in operational status for the near future. Efforts underway at the NASA-Lewis Research Center regarding rehabilitation of the Icing Research Tunnel and considering a major new icing test facility are endorsed. The US Army Helicopter Icing Spray System Improvement Program is also supported by the Working Group and, as a recommendation for future discussion, the need for European airborne icing spray systems should be considered. A conclusion reached by the Working Group is that current full scale development and qualification facilities and procedures are extremely expensive and time consuming. J.D.H.

N82-11060# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

ICE PROTECTION SYSTEM TECHNOLOGY

In its Rotorcraft Icing Aug. 1981 p 54-99 refs

Avail: NTIS HC A07/MF A01

Deicing systems technology concepts are discussed. The conclusion is that electrothermal deicing systems are the only effective present system for broad application. However, it is noted that the cost of electrothermal deicing in terms of weight, power and expense is high, and provides an incentive for examination of alternatives. Therefore, additional work is clearly warranted on options such as ice phobics, fluid ice suppressant systems, pneumatic boots, vibratory surface systems, microwave and other hybrid systems concepts. It is recommended that the operational limitations of ice protected aircraft such as the Black Hawk and Puma, be explored with the ice protection systems deliberately turned off, so as to simulate an aircraft without (or with inoperative) ice protection. Only through such definition of the actual icing environment can a better estimation be made of the operational impact of icing conditions on helicopter flight operations. J.D.H.

N82-11061# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

PROPOSED STANDARD REQUIREMENTS AND PROCEDURES FOR ICING CLEARANCE

In its Rotorcraft Icing Aug. 1981 p 100-117

Avail: NTIS HC A07/MF A01

A set of proposed standard requirements and procedures for icing clearance is presented. It is felt that this clearance procedure constitutes a basis for NATO-wide icing clearance and should be adopted by the NATO military community as an interim approach. The opportunity also exists to consider this proposal for civil icing clearance. J.D.H.

N82-11062# Hughes Aircraft Co., El Segundo, Calif. Display Systems Lab.
STUDY AND DEVELOPMENT OF AN INTEGRATED HEAD-UP DISPLAY Final Report, 1 Jul. 1976 - 31 Aug. 1980
Michael N. Ernstoff Jun. 1981 112 p refs
(Contract F33615-76-C-1243; AF Proj. 2003)
(AD-A104337; HAC-D6210; AFWAL-TR-81-1042) Avail: NTIS HC A06/MF A01 CSCL 14/5

The purpose of the Integrated Head-Up Display (I-HUD) program was to demonstrate the advantages associated with using a Liquid Crystal Matrix Display and Diffraction Optics combiner in the design and construction of a high brightness head-up display system. The program resulted in the design and fabrication of the I-HUD brassboard consisting of a pilot's display unit, built in a form factor similar to that of the production F16 HUD, and test support equipment. The following devices and modules were developed: A 350-by-350 pixel Liquid Crystal Matrix Display complete with custom LSI circuit drivers, a diffraction optics combiner, a diffraction optics diffusing screen, a specular mode projector, and custom lamp with a narrow band (green) spectral output. Although the completed I-HUD brassboard did not meet all of its design goals, it does demonstrate the feasibility of applying advanced technology to the designs of Head-Up Displays. The I-HUD program has succeeded in solving many of the fundamental design problems associated with this approach and stands as a milestone in the development of solid state display devices and the development of more highly reliable, cost effective Head-Up Displays. GRA

N82-11063# Panametrics, Inc., Waltham, Mass.
ADVANCED FUEL FLOWMETER FOR FUTURE NAVAL AIRCRAFT Final Report, Dec. 1977 - Apr. 1981
L. C. Lynnworth, N. E. Pedersen, J. E. Bradshaw, J. E. Matson, E. S. Johansson, and T. H. Nguyen 28 Jun. 1981 149 p refs
(Contract N62269-78-C-0069)
(AD-A104364; NADC-80254-60) Avail: NTIS HC A07/MF A01 CSCL 21/4

A fuel mass flowmeter was developed with the objective of accurately measuring the mass flow rate M-dot of various fuels and their mixtures, for flow rates from 91 to 11,364 kg/hr (200 to 25,000 lb/hr). The delivered system included: (1) an area averaging zigzag flow velocimeter cell, in which the fuel was interrogated in opposite directions by an alternating sequence of ultrasonic pulses, to determine the area averaged flow velocity, V-bar; (2) a densitometer based on the Clausius-Mosotti law, in which the fuel density rho is determined; and (3) electronics which computed rho and V-bar separately, and then generated a square wave output having a frequency proportional to the product of rho and V-bar, namely M-dot = rho(V-bar)A, where A = velocimeter cell cross sectional area. The transducers can operate beyond the temperature range -38 to +150 C, and the flow cell, with transducers, at pressures up to 1500 psig and in the 3-axis, 20 g, 5 to 2000 Hz vibration environment specified by MIL Std. 810-514.1, except for noise problems at a few discrete frequencies. GRA

N82-11064# General Electric Co., Binghamton, N.Y. Aircraft Equipment Div.
ELECTRONIC MASTER MONITOR AND ADVISORY DISPLAY SYSTEM, DATA TRANSMISSION STUDY Interim Report, Jun. 1979 - Aug. 1980
Aug. 1980 57 p refs
(Contract DAAK80-79-C-0270; DA Proj. 1L2-62202-AH-85)
(AD-A104243; ACS-12177; USAAVRADCOM-TR-79-0270-1; IR-1) Avail: NTIS HC A04/MF A01 CSCL 17/2

The development of nonmission related status information is one area of rotary wing instrumentation which has not kept pace with the state of art. This includes raw data, discrete and summary status information related to the engine, transmission, rotor, fuel, hydraulic and electrical subsystems. The objective of this report is to define an efficient and cost effective data transmission method for an electronic master monitor and advisory display system (EMMADS). Several current standard and nonstandard data bus specifications which are applicable to the EMMADS system are introduced. Their tradeoff in terms of hardware, software and system considerations are compared. It should be noted that a typical standard bus specs addresses only the protocol and message formats, not the mechanization of the control algorithm. Hence there is a considerable variation in implementation and cost even for the same bus standard. The materials represent a snapshot of the current state of the art technology. The use of optical fiber instead of conventional electrical cable (such as coaxial) as the transmission medium is also investigated based on the current technical reports. The problems of electromagnetic interference (EMI), and rejection techniques are mentioned. GRA

N82-11065# General Electric Co., Binghamton, N.Y. Aircraft Equipment Div.
ELECTRONIC MASTER MONITOR AND ADVISORY DISPLAY SYSTEM, HUMAN ENGINEERING SUMMARY REPORT Interim Report, Jun. 1979 - Jun. 1981
Jun. 1981 227 p refs
(Contract DAAK80-79-C-0270; DA Proj. 1L2-62202-AH-85)
(AD-A104244; ACS-12365; USAAVRADCOM-TR-79-0270-3; IR-3) Avail: NTIS HC A11/MF A01 CSCL 17/2

Information requirements, information handling formats, and the necessary display/control design criteria are discussed for a system being developed to integrate and display nonmission related information on the status of various subsystems on rotary wing aircraft. GRA

N82-11066# Los Alamos Scientific Lab., N. Mex. Electronics Div.
OUTSIDER'S LOOK AT FLIGHT INSTRUMENTATION
Arvid S. Lundy 1981 7 p refs Presented at the AIAA/SAE/ASME Joint Propulsion Conf., Colorado Springs, Colo., 27-29 Jul. 1981
(Contract W-7405-eng-36)
(DE81-025409; LA-UR-81-1748; CONF-810724-1) Avail: NTIS HC A02/MF A01

Ideas and speculations on possible diagnostic instrumentation for use in missile flight testing are presented. Techniques for use in the development of flight instrumentation are recommended. DOE

N82-11067# National Aerospace Lab., Tokyo (Japan).
NEW MOLDING METHOD OF THREE-DIMENSIONAL HOLLOW PHOTOELASTIC MODEL AND CENTRIFUGAL STRESS ANALYSIS OF AIR COOLED TURBINE BLADE MODEL
Toyoaki Yoshida, Katsutashi Matsusue, Kitao Takahara, and Ryosaku Hashimoto May 1981 17 p refs In ENGLISH; JAPANESE Summary
(NAL-TR-427T; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

A new molding method for a three dimensional hollow photoelastic model was invented and centrifugal stress analysis performed for air cooled turbine blade models to which the new method was applied. A distinctive feature of the molding method is the introduction of a copper coated wax core which forms a three dimensional hollow shape inside a model. The air cooled turbine photoelastic model with a coolant passage simulates the first stage rotor blade in the high temperature turbine full scale model HT-10H used at the NAL. The results of stress analysis cleared the critical regions and stress magnitude and thus they are of great aid to the successful development of a full scale turbine model. Author

N82-11068*# Teledyne Continental Motors, Muskegon, Mich. General Products Div.
LIGHTWEIGHT DIESEL ENGINE DESIGNS FOR COMMUTER TYPE AIRCRAFT
Alex P. Brouwers Jul. 1981 70 p refs
(Contract NAS3-22149)
(NASA-CR-165470; Rept-995) Avail: NTIS HC A04/MF A01 CSCL 21E

Conceptual designs and performance of advanced technology lightweight diesel engines, suitable for commuter type aircraft power plants are defined. Two engines are discussed, a 1491 kW (2000 SHP) eight-cylinder engine and a 895 kW (1200 SHP) six-cylinder engine. High performance and related advanced technologies are proposed such as insulated cylinders, very high injection pressures and high compressor and turbine efficiencies. The description of each engine includes concept drawings, a performance analysis, and weight data. Fuel flow data are given for full and partial power up to 7620m altitude. The performance data are also extrapolated over a power range from 671 kW(900 SHP) to 1864 kW (2500 SHP). The specific fuel consumption of the 1491 kW (2000 SHP) engine is 182 g/hWh (.299 lb/HPh) at cruise altitude, its weight 620 kg (1365 lb.) and specific weight .415 kg/kW (.683 lb/HP). The specific fuel consumption of the 895 kW (1200 SHP) engine is 187 g/hWh (.308 lb/HPh) at cruise altitude, its weight 465 kg (1025 lb.) and specific weight .520 kg/kW (.854 lb/HP). R.J.F.

N82-11069# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.

SUBSONIC CASCADE WIND TUNNEL TESTS USING A COMPRESSOR CONFIGURATION OF DCA BLADES M.S. Thesis

Frank S. Cina Jun. 1981 210 p refs

(AD-A104597) Avail: NTIS HC A10/MF A01 CSCL 21/5

Tests are reported in which air incidence angle was varied to a cascade of 20 blades, 5 inches in chord with aspect ratio of 2.0 and solidity of 1.67. Preliminary blade element performance data were obtained using pneumatic probe surveys and surface pressures were also measured. Results of preparatory tests of a similar cascade of 15 C-series blades at a solidity of 1.28 are also included. Whereas the flow in the C-series blading cascade was always acceptable, the flow in the DCA blading cascade was not acceptable at negative incidence angles. A modification of the cascade inlet guide vanes is recommended which will guarantee periodic conditions and serve to generate more nearly uniform inlet flow at all test conditions. Author (GRA)

N82-11070*# Analytical Mechanics Associates, Inc., Hampton, Va.

AN INFLUENCE COEFFICIENT METHOD FOR THE APPLICATION OF THE MODAL TECHNIQUE TO WING FLUTTER SUPPRESSION OF THE DAST ARW-1 WING Final Report

Samuel Pines Nov. 1981 49 p refs

(Contract NAS1-15593)

(NASA-CR-165772; AMA-81-25) Avail: NTIS HC A03/MF A01 CSCL 01C

The methods used to compute the mass, structural stiffness, and aerodynamic forces in the form of influence coefficient matrices as applied to a flutter analysis of the Drones for Aerodynamic and Structural Testing (DAST) Aeroelastic Research Wing. The DAST wing was chosen because wind tunnel flutter test data and zero speed vibration data of the modes and frequencies exist and are available for comparison. A derivation of the equations of motion that can be used to apply the modal method for flutter suppression is included. A comparison of the open loop flutter predictions with both wind tunnel data and other analytical methods is presented. S.L.

N82-11071*# Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.

AEROACOUSTIC THEORY FOR NONCOMPACT WING-GUST INTERACTION

Rudolph Martinez and Sheila E. Widnall Oct. 1981 124 p refs

(Grant NsG-2142)

(FDRL-81-7) Avail: NTIS HC A06/MF A01 CSCL 01C

Three aeroacoustic models for noncompact wing-gust interaction were developed for subsonic flow. The first is that for a two dimensional (infinite span) wing passing through an oblique gust. The unsteady pressure field was obtained by the Wiener-Hopf technique; the airfoil loading and the associated acoustic field were calculated, respectively, by allowing the field point down on the airfoil surface, or by letting it go to infinity. The second model is a simple spanwise superposition of two dimensional solutions to account for three dimensional acoustic effects of wing rotation (for a helicopter blade, or some other rotating planform) and of finiteness of wing span. A three dimensional theory for a single gust was applied to calculate the acoustic signature in closed form due to blade vortex interaction in helicopters. The third model is that of a quarter infinite plate with side edge through a gust at high subsonic speed. An approximate solution for the three dimensional loading and the associated three dimensional acoustic field in closed form was obtained. The results reflected the acoustic effect of satisfying the correct loading condition at the side edge. R.J.F.

N82-11072# Boeing Military Airplane Development, Seattle, Wash. Advanced Airplane Branch.

AIRCRAFT DIGITAL INPUT CONTROLLED HYDRAULIC ACTUATION AND CONTROL SYSTEM Final Report, Aug. 1977 - Dec. 1980

Eugene T. Raymond and Curtiss W. Robinson Mar. 1981 214 p refs

(Contract F33615-77-C-2034; AF Proj. 3145)

(AD-A104263; AFWAL-TR-81-2012) Avail: NTIS HC A10/MF A01 CSCL 09/2

The development of an incremental digitally-controlled electrohydraulic incremental digitally-controlled electrohydraulic actuation system (DEHA) is reported. An electronic digital controller and a prototype DEHA unit, with an electric-stepper-motor-driven rotary distributor valve, two hydraulic drive motors, and a torque-summing gearbox, were assembled. Significant reductions in the hydraulic power normally required with a conventional geared hydraulic motor system, and some degree of hydraulic power recovery were obtained. Author (GRA)

N82-11073# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Guidance and Control Panel.

THEORY AND APPLICATIONS OF OPTIMAL CONTROL IN AEROSPACE SYSTEMS

Pieter Kant, ed. (National Aerospace Lab., Emmeloord, Netherlands) London Jul. 1981 283 p refs

(AGARD-AG-251; ISBN-92-835-1391-6) Copyright. Avail: NTIS HC A13/MF A01

The basic concepts of control theory were reviewed. Pratical design techniques that were developed from the theory are presented. Design examples and practical applications in real systems are described. Major emphasis is on flight control of distributed parameter systems.

N82-11074# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.

AN OVERVIEW OF OPTIMAL CONTROL IN AEROSPACE SYSTEMS

Arthur E. Bryson, Jr. *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 5 p refs

Avail: NTIS HC A13/MF A01

Optimal control started with the calculus of variations (COV). The digital computer made the calculus of variations a practical tool for synthesis of optimal control logic. Optimal control concepts and algorithms are used not only in the field of automatic control but also in fields of structural optmization, econometrics, and operations research. T.M.

N82-11075# Universite Catholique de Louvain (Belgium).

THEORY OF STOCHASTIC OPTIMAL CONTROL SOME BASIC NOTIONS

In AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 19 p refs

Avail: NTIS HC A13/MF A01

The optimal control problem for stochastic systems is described in details. Several classes of policy are defined and compared. The corresponding solutions are deduced from Bellman's principle and discussed in connection with the concept of dual effect of the control. After the derivation of the optimal closed-loop solution for the linear quadratic Gaussian problem, several algorithms are proposed for the nonlinear problem and discussed in the perspective of their implementation in aerospace applications. T.M.

N82-11076# Princeton Univ., N. J. Flight Research Lab.

AN INTRODUCTION TO STOCHASIC OPTIMAL CONTROL THEORY

In AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 33 p refs

Avail: NTIS HC A13/MF A01

The design of control logic that commands a dynamic system to a desired output or that augments the system's stability is facilitated if objectives are expressed in a quantitative criterion, because the optimization of this criterion establishes a feasible design point for control. If the information which the control logic must use is uncertain or if the dynamic system is forced by random disturbances, only the expected value can be optimized. The methodology for design is based upon stochastic optimal control theory. After introducing the dynamic models of interest, optimal control and estimation are presented separately. Limitations of this approach are addressed, and the unified design of linear stochastic optimal controllers for analog and digital implementations is described. The principal benefit of stochastic optimal control theory is that it provides an engineering framework within which practical control design can be accomplished for complex dynamic systems. T.M.

N82-11077# Royal Aircraft Establishment, Farnborough (England). Flight Systems Dept.

DESIGN CONSIDERATIONS FOR OPTIMAL FLIGHT CONTROL SYSTEMS

F. R. Gill *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 21 p refs

Avail: NTIS HC A13/MF A01

Following a review of the several interacting factors affecting the design of control laws for any kind of flight control system (FCS), the modelling problem is discussed, including accuracy requirements for computer models of the aircraft, FCS, external disturbances and sensor noise. The state-of-the-art in designing the control and scheduling laws is surveyed and the limits of conventional control techniques are exposed. To overcome these limits, the use of selected nonlinear control techniques is discussed, including the concept of redundant adaptation with safeguards. T.M.

N82-11078*# Honeywell Systems and Research Center, Minneapolis, Minn. Systems and Control Technology Sect.

DESIGN TECHNIQUES FOR MUTLIVARIABLE FLIGHT CONTROL SYSTEMS

In AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 33 p refs

(Contracts NAS4-2518; N00014-75-C-01444)

Avail: NTIS HC A13/MF A01 CSCL 01C

Techniques which address the multi-input closely coupled nature of advanced flight control applications and digital implementation issues are described and illustrated through flight control examples. The techniques described seek to exploit the advantages of traditional techniques in treating conventional feedback control design specifications and the simplicity of modern approaches for multivariable control system design. T.M.

N82-11079# Bodenseewerk Geraetetechnik G.m.b.H., Ueberlingen (West Germany).

PRACTICAL DESIGN AND REALIZATION OF A DIGITAL ADAPTIVE FLIGHT CONTROL SYSTEM

V. Krebs and U. Hartmann *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 22 p refs

Sponsored in part by the West German Ministry of Defense

Avail: NTIS HC A13/MF A01

A new approach for the design and the practical realization of a digital adaptive command and stability system is proposed. The control law for the longitudinal motion of the aircraft is obtained by state vector feedback using the MIL-F-8785 B handling qualities requirements. The design principle is based on decoupling of the angle of attack and pitch rate on the one hand and the pole allocation method for the eigenvalues of the control system on the other hand. Since the necessary gain factors contain unknown and variable aircraft parameters, an on-line fading-memory least squares algorithm for the estimation of these parameters is used. Only conventional aircraft sensors (rate gyros and accelerometers) and an airborne digital computer are necessary. Hybrid simulations of the complete system as well as flight test results demonstrate the efficiency of the concept. T.M.

N82-11080# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany).

CONTROL LAW DESIGN FOR TRANSPORT AIRCRAFT FLIGHT TASKS

Volkmar Adam and Hagen Leyendecker *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 13 p refs

Avail: NTIS HC A13/MF A01

An integrated digital flight control system was developed. The primary objective of the program was, both to improve the manual control of the aircraft assisted by control systems, and to develop new control and display systems. In addition, automation is to be provided for later flight phases which are to be optimized with respect to fuel consumption, flight time or other criteria. Aspects of CCV control law design and flight test experience with the integrated digital flight control system are described. D.M.

N82-11081# Purdue Univ., Lafayette, Ind. School of Aeronautics and Astronautics.

CONTROL DESIGN OF FLEXIBLE SPACECRAFT

Robert E. Skelton *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 26 p refs

Avail: NTIS HC A13/MF A01

When compared to other large scale systems, flexible spacecraft have some peculiarities which can make control more difficult. Emphasis is placed upon the time domain and suboptimal linear quadratic gaussian (LQG) methods, with special attention given to the effects of modeling errors. These effects are discussed in light of the model reduction problem, stability, and control design. Stability, controllability and observability computations are reduced to their simplest form possible to provide insight and to facilitate the location of sensors and actuators. The techniques of modal cost analysis are used to identify the critical parameters and the critical models of the structure. In the final stage of design, component cost analysis reveals which states of the optimal dynamical controller should be deleted to produce a reduced controller which is compatible with the on-line computer software limitations. T.M.

N82-11082*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

OPTIMUM CLIMB AND DESCENT TRAJECTORIES FOR AIRLINE MISSIONS

Heinz Erzberger *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 15 p refs

Avail: NTIS HC A13/MF A01 CSCL 01C

The characteristics of optimum fixed-range trajectories whose structure is constrained to climb, steady cruise, and descent segments are derived by application of optimal control theory. The performance function consists of the sum of fuel and time costs, referred to as direct operating cost (DOC). The state variable is range to go and the independent variable is energy. In this formulation a cruise segment always occurs at the optimum cruise energy for sufficiently large range. At short ranges (400 n. mi. and less), a cruise segment may also occur below the optimum cruise energy. The existence of such a cruise segment depends primarily on the fuel flow vs thrust characteristics and on thrust constraints. If thrust is a free control variable along with airspeed, it is shown that such cruise segments will not generally occur. If thrust is constrained to some maximum value in climb and to some minimum in descent, such cruise segments generally will occur. T.M.

N82-11083*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

APPLICATION OF NONLINEAR SYSTEMS INVERSES TO AUTOMATIC FLIGHT CONTROL DESIGN: SYSTEM CONCEPTS AND FLIGHT EVALUATIONS

George Meyer and Luigi Cicolani *In* AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 39 p refs

Avail: NTIS HC A13/MF A01 CSCL 01C

A practical method for the design of automatic flight control systems for aircraft with complex characteristics and operational requirements, such as the powered lift STOL and V/STOL configurations, is presented. The method is effective for a large class of dynamic systems requiring multi-axis control which have highly coupled nonlinearities, redundant controls, and complex multidimensional operational envelopes. It exploits the concept of inverse dynamic systems, and an algorithm for the construction of inverse is given. A hierarchic structure for the total control logic with inverses is presented. The method is illustrated with an application to the Augmentor Wing Jet STOL Research Aircraft equipped with a digital flight control system. Results of flight evaluation of the control concept on this aircraft are presented. T.M.

N82-11084*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MANAGEMENT OF REDUNDANCY IN FLIGHT CONTROL SYSTEMS USING OPTIMAL DECISION THEORY

In AGARD Theory and Appl. of Optimal Control in Aerospace

Systems Jul. 1981 12 p refs

Avail: NTIS HC A13/MF A01 CSCL 01C

The problem of using redundancy that exists between dissimilar systems in aircraft flight control is addressed. That is, using the redundancy that exists between a rate gyro and an accelerometer--devices that have dissimilar outputs which are related only through the dynamics of the aircraft motion. Management of this type of redundancy requires advanced logic so that the system can monitor failure status and can reconfigure itself in the event of one or more failures. An optimal decision theory was tutorially developed for the management of sensor redundancy and the theory is applied to two aircraft examples. The first example is the space shuttle and the second is a highly maneuvering high performance aircraft--the F8-C. The examples illustrate the redundancy management design process and the performance of the algorithms presented in failure detection and control law reconfiguration. T.M.

N82-11087# Systems Control, Inc., Palo Alto, Calif.
DEVELOPMENT OF MULTIVARIABLE CONTROLLERS FOR AIRCRAFT TURBINE ENGINES
Ronald L. DeHoff, Stephen M. Rock, and Muhammed M. Akhter
In AGARD Theory and Appl. of Optimal Control in Aerospace Systems Jul. 1981 12 p refs

Avail: NTIS HC A13/MF A01

A model reference structure is discussed which is shown to be a flexible framework within which digital control programs of a wide variety of function and complexity can be formulated. The development of the plant reference model is discussed and trade-offs between accuracy and complexity presented. The techniques used to produce optimized, feed-forward state, control and output trajectories are presented. The well-known methods of regulator synthesis using quadratic performance functions are briefly reviewed and the results of several successful applications of this methodology are summarized. T.M.

N82-11089 Royal Aircraft Establishment, Bedford (England). Library.
ADAPTATION OF A TURBINE TEST FACILITY TO HIGH-TEMPERATURE RESEARCH
J. Francois, Y. LeBot, J. Michard, and P. Deguest Dec. 1980 30 p refs Transl. into ENGLISH from AGARD Conf. Proc. No. 229, Ankara, Sept.
(RAE-Lib-Trans-2064; BR78650) Copyright. Avail: Issuing Activity

A facility for research on a high temperature (1800 K) and high pressure (4.5 bar) turbine stage is described. The turbine operates in a realistic engine environment and is comprehensively instrumented to permit wide variation of mainstream and coolant flow parameters. The development of robust probes for the measurement of turbulence and temperature fluctuations and optical pyrometry techniques is described. Results of studies of nozzle guide vane heat transfer coefficients, metal temperatures and film cooling efficiency are presented together with rotor blade surface temperature distributions. The MINOS rig confirmed the validity of turbine design prediction methods by providing performance data to correlate theory, scale model testing and gas turbine engine testing. T.M.

N82-11212# Naval Surface Weapons Center, White Oak, Md. Research and Technology Dept.
POLYURETHANE FOAMS FOR AIRCRAFT SHOCK MOUNTS. 3: VIBRATION DAMPING BY POLYETHER FOAMS Progress Report, Sep. 1979 - Jun. 1980
James V. Duffy Jul. 1981 38 p refs
(AD-A104496; NSWC/TR-80-343) Avail: NTIS HC A03/MF A01 CSCL 11/9

The objective of this program was to develop flexible foam systems which would meet the specifications outlined in MIL-F-81334B(AS). The vibration damping and mechanical properties of a series of foams based on mixtures of poly (oxytetramethylene) glycol and poly(oxypropylene) polyol were determined. The effect of polyol ratio, foam density, surfactant type and unit loading on vibration output transmissibility for these systems is reported. Author (GRA)

N82-11224*# Lockheed-California Co., Burbank.
EXPERIMENTAL STUDY OF FUEL HEATING AT LOW TEMPERATURES IN A WING TANK MODEL, VOLUME 1 Final Report
Francis J. Stockemer Aug. 1981 75 p refs
(Contract NAS3-21977)
(NASA-CR-165391; LR-29835-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 21D

Scale model fuel heating systems for use with aviation hydrocarbon fuel at low temperatures were investigated. The effectiveness of the heating systems in providing flowability and pumpability at extreme low temperature when some freezing of the fuel would otherwise occur is evaluated. The test tank simulated a section of an outer wing tank, and was chilled on the upper and lower surfaces. Turbine engine lubricating oil was heated, and recirculating fuel transferred the heat. Fuels included: a commercial Jet A; an intermediate freeze point distillate; a higher freeze point distillate blended according to Experimental Referee Broadened Specification guidelines; and a higher freeze point paraffinic distillate used in a preceding investigation. Each fuel was chilled to selected temperature to evaluate unpumpable solid formation (holdup). Tests simulating extreme cold weather flight, without heating, provided baseline fuel holdup data. Heating and recirculating fuel increased bulk temperature significantly; it had a relativley small effect on temperature near the bottom of the tank. Methods which increased penetration of heated fuel into the lower boundary layer improved the capability for reducing holdup. S.L.

N82-11229# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Fuels and Lubrication Div.
JET FUEL LOCKS TO SHALE OIL: THE 1980 TECHNOLOGY REVIEW
Herbert R. Lander May 1981 166 p refs Proceedings of Conf. held at Cincinnati, 19-20 Nov. 1980
(AF Proj. 2480)
(AD-A104414; AFWAL-TR-81-2083) Avail: NTIS HC A08/MF A01 CSCL 11/4

The progress of several Air Force shale oil related programs is reported. Three shale oil processing studies evaluating the yield, cost, and quality of JP-4 and JP-8 turbine fuel produced from whole crude shale oil are discussed. Details of a fourth program that produced 11,300 gallons of specification JP-4 from Geokinetics shale oil are reported. Some of this jet fuel was tested in Air Force Fuel Mainburner/Turbine Effects Programs and was shown to behave very similar to petroleum derived JP-4. An additional study concentrated on developing hydrotreating catalysts that would more efficiently convert shale oil into aviation turbine fuel. Author (GRA)

N82-11230*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.
AN ASSESSMENT OF THE USE OF ANTIMISTING FUEL IN TURBOFAN ENGINES Final Report, Sep. 1979 - Nov. 1980
A. Fiorentino, R. DeSaro, and T. Franz Jun. 1981 53 p refs
(Contract NAS3-22045)
(NASA-CR-165258; AD-A104673; PWA-5697-29; FAA-CT-81-58) Avail: NTIS HC A04/MF A01 CSCL 21/4

An evaluation was made on the effects of using antimisting kerosene (AMK) on the performane of the components from the fuel system and the combustor of a current in-service JT8D aircraft engine. The objectives were to identify problems associated with using antimisting kerosene and to determine the extent of shearing or degradation required to allow the engine components to achieve satisfactory operation. The program consisted of a literature survey and a test program which evaluated the antimisting kerosene fuel in laboratory and bench component testing, and assessed the performance of the combustor in a high pressure facility and in an altitude relight/cold ignition facility. Performance of the fuel pump and control system was evaluated in an open loop simulation. Thus far, results of the program would not preclude the use of antimisting kerosene in a jet engine application. GRA

N82-11232# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.
AN INVESTIGATION OF THE COMBUSTION PROCESS IN SOLID FUEL RAMJETS M.S. Thesis
William Vernon Goodwin Jun. 1981 56 p refs
(AD-A104603) Avail: NTIS HC A04/MF A01 CSCL 21/4

An experimental investigation was conducted into four areas of the solid fuel ramjet combustion process: (1) the effects of near-wall turbulent mixing and equivalence ratio on combustion efficiency, (2) the effects of bypass air on combustion efficiency, (3) the combustion process in a cylindrically perforated fuel grain with a twin side-dump/dome configuration, and (4) the comparison of experimental radial temperature profiles to computer generated radial profiles. Polymethylmethacrylate fuel grains were burned in a ramjet motor and a thrust stand. Combustion efficiencies were determined and compared for different configurations. It was found to be insensitive to variations in the mixture ratio and to near-wall mixing. Bypass air was found to adversely affect the combustion efficiency both in stable and unstable combustion environments. The twin side-dump/dome configuration was unable to sustain combustion for all conditions investigated. Theoretical radial temperature profiles were found to have larger near wall gradients than were measured experimentally. Author (GRA)

N82-11313# New Mexico Univ., Albuquerque. Engineering Research Inst.

DESIGN OF AIRPORT PAVEMENTS FOR EXPANSIVE SOILS Final Report

R. Gordon McKeen Jan. 1981 188 p refs
(Contract F29601-76-C-0061)
(AD-A104660; NMERI-AP-37; FAA-RD-81-25) Avail: NTIS HC A09/MF A01 CSCL 08/13

Expansive soil subgrades exhibit volume changes with variation in moisture condition. These changes result in differential movement of airport pavements resting on these soils. Special design procedures must be used to account for the expansive soil activity during equilibration. In addition, special precautions are required to protect the subgrade from moisture variation with climate. Measurement of soil suction is a key step in quantifying moisture-induced soil behavior. Procedures are outlined for suction characterization of the soil and for estimating the in situ differential movement likely to occur under the pavement. Once the wavelength and amplitude characteristics of the differential movement are obtained, design calculations to select the thickness and materials for the pavement may proceed. GRA

N82-11339*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

GENERAL AVIATION AIRCRAFT ANTENNAS FOR THE GLOBAL POSITIONING SYSTEM

Melvin C. Gilreath and J. S. Chatterjee Oct. 1981 37 p refs
(NASA-TM-83212) Avail: NTIS HC A03/MF A01 CSCL 17G

Several antenna designs that utilize the NAVSTAR Global Positioning System in a low-cost system for general aviation aircraft were evaluated. Experimental investigations were made of crossed-dipoles, various types of crossed-slots, and microstrip antennas with modifications to improve their coverage. Principal plane radiation patterns for several of these antennas were measured on a one-seventh scale model of a Gates Lear Jet. R.J.F.

N82-11364# Edgerton, Germeshausen and Grier, Inc., Albuquerque, N. Mex.

SYSTEM SAFETY PROGRAM PLAN Final Report, 31 Mar. - 8 Aug. 180

A. J. Benham 8 Aug. 1980 79 p refs
(Contract DNA001-80-C-0177)
(AD-A104557; AG-1446; DNA-5467F) Avail: NTIS HC A05/MF A01 CSCL 12/12

This document, System Safety Program Plan, is the implementing document covering the safety aspects of performing an EMP Test on the A7E aircraft in the HPD (Horizontally Polarized Dipole), VPD (Vertically Polarized Dipole), and NWEF hangar facilities at Kirtland AFB, New Mexico. GRA

N82-11391*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AMPLIFIED CROSSFLOW DISTURBANCES IN THE LAMINAR BOUNDARY LAYER ON SWEPT WINGS WITH SUCTION

J. Ray Dagenhart Nov. 1981 80 p refs
(NASA-TP-1902; L-14433) Avail: NTIS HC A05/MF A01 CSCL 20D

Solution charts of the Orr-Sommerfeld equation for stationary crossflow disturbances are presented for 10 typical velocity profiles on a swept laminar flow control wing. The critical crossflow Reynolds number is shown to be a function of a boundary layer shape factor. Amplification rates for crossflow disturbances are shown to be proportional to the maximum crossflow velocity. A computer stability program called MARIA, employing the amplification rate data for the 10 crossflow velocity profiles, is constructed. This code is shown to adequately approximate more involved computer stability codes using less than two percent as much computer time while retaining the essential physical disturbance growth model. Author

N82-11431*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

INTEGRATED ANALYSIS OF ENGINE

Christos C. Chamis 1981 24 p refs Presented at the Ann. Meeting of the ASME, Washington, D.C., 15-21 Nov. 1981
(NASA-TM-82713; E-988) Avail: NTIS HC A02/MF A01 CSCL 20K

The need for light, durable, fuel efficient, cost effective aircraft requires the development of engine structures which are flexible, made from advanced materials (including composites), resist higher temperatures, maintain tighter clearances and have lower maintenance costs. The formal quantification of any or several of these requires integrated computer programs (multilevel and/or interdisciplinary analysis programs interconnected) for engine structural analysis/design. Several integrated analysis computer programs are under development at Lewis Research Center. These programs include: (1) COBSTRAN-Composite Blade Structural Analysis, (2) CODSTRAN-Composite Durability Structural Analysis, (3) CISTRAN-Composite Impact Structural Analysis, (4) STAEBL-StruTailoring of Engine Blades, and (5) ESMOSS-Engine Structures Modeling Software System. Three other related programs, developed under Lewis sponsorship, are described. Author

N82-11469# Army Engineer Waterways Experiment Station, Vicksburg, Miss. Geotechnical Lab.

STRUCTURAL ANALYSIS COMPUTER PROGRAMS FOR RIGID MULTICOMPONENT PAVEMENT STRUCTURES WITH DISCONTINUITIES, WESLIQID AND WESLAYER. REPORT 1: PROGRAM DEVELOPMENT AND NUMERICAL PRESENTATIONS Technical Report, 1 Oct. 1978 - 30 Sep. 1979

Yu T. Chou May 1981 150 p refs
(DA Proj. 4A7-62719-AT-40)
(AD-A104645; WES/TR/GL-81-6-1) Avail: NTIS HC A07/MF A01 CSCL 13/13

This study was conducted to develop finite element computer programs to calculate stresses and deflections in rigid pavements with cracks and joints subjected to loads and temperature warping, as well as in the supporting subgrade soil. The joints are connected by dowel bars or other load transfer devices. The slabs can have full or partial loss of subgrade support over designated regions of the slabs. Multiple-wheel loads can be handled and the number of wheels is not limited. Two programs were developed, one called WESLIQID and the other WESLAYER. The former is for pavements on liquid foundations and the latter is for linear layered elastic solids. Variable slab thicknesses and moduli of subgrade reaction are incorporated in the WESLIQID program, and any number of slabs arrayed in an arbitrary pattern can be handled. Because of larger computer storage requirement and computational complexity, the WESLAYER program is limited to two slabs. GRA

N82-11514*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

RADAR MAPPING, ARCHAEOLOGY, AND ANCIENT LAND USE IN THE MAYA LOWLANDS

R. E. W. Adams (Cambridge Univ.), W. E. Brown, Jr., and T. Patrick Culbert (Arizona Univ.) 31 Mar. 1981 27 p refs
(Contract NAS7-100)
(NASA-CR-164931) Avail: NTIS HC A03/MF A01 CSCL 08B

Data from the use of synthetic aperture radar in aerial survey of the southern Maya lowlands suggest the presence of very large areas drained by ancient canals for the purposes of intensive cultivation. Preliminary ground checks in several very limited areas confirm the existence of canals and raised fields. Excavations and ground surveys by several scholars provide valuable complementary information. Taken together, the new data suggest that Late Classic period Maya civilization was firmly grounded in large-scale and intensive cultivation of swampy zones. A.R.H.

N82-11636*# National Aeronautics and Space Administration, Washington, D. C.

EFFECTS OF AIRCRAFT NOISE ON THE EQUILIBRIUM OF AIRPORT RESIDENTS: TESTING AND UTILIZATION OF A NEW METHODOLOGY

Jacques Francois Sep. 1981 34 p Transl. into ENGLISH of "Repercussion du Bruit des Avions sur l'Equilibre des Riverains des Aeroports: Test et Mise au Point d'une Methodologie Nouvelle" Paris, Aug. 1977 p 1-134 Transl. was announced as N81-27692 Transl. Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by IFOP/ETMAR
(Contract NASw-3542)
(NASA-TM-76628) Avail: NTIS HC A03/MF A01 CSCL 13B

The focus of the investigation is centered around two main themes: an analysis of the effects of aircraft noise on the psychological and physiological equilibrium of airport residents; and an analysis of the sources of variability of sensitivity to noise. The methodology used is presented. Nine statistical tables are included, along with a set of conclusions. T.M.

N82-11659*# United Technologies Research Center, East Hartford, Conn.

HELICOPTER ROTOR TRAILING EDGE NOISE Final Report

Robert H. Schlinker and Roy K. Amiet Washington NASA Nov. 1981 150 p refs
(Contract NAS1-15730)
(NASA-CR-3470) Avail: NTIS HC A07/MF A01 CSCL 20A

A two dimensional section of a helicopter main rotor blade was tested in an acoustic wind tunnel at close to full-scale Reynolds numbers to obtain boundary layer data and acoustic data for use in developing an acoustic scaling law and testing a first principles trailing edge noise theory. Results were extended to the rotating frame coordinate system to develop a helicopter rotor trailing edge noise prediction. Comparisons of the calculated noise levels with helicopter flyover spectra demonstrate that trailing edge noise contributes significantly to the total helicopter noise spectrum at high frequencies. This noise mechanism is expected to control the minimum rotor noise. In the case of noise radiation from a local blade segment, the acoustic directivity pattern is predicted by the first principles trailing edge noise theory. Acoustic spectra are predicted by a scaling law which includes Mach number, boundary layer thickness and observer position. Spectrum shape and sound pressure level are also predicted by the first principles theory but the analysis does not predict the Strouhal value identifying the spectrum peak. A.R.H.

N82-11660*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SEL AND EPNL NOISE DURATION COEFFICIENTS FOR THE 747 AND T-38 AIRCRAFT

William L. Willshire, Jr. Sep. 1981 12 p refs
(NASA-TM-83214) Avail: NTIS HC A02/MF A01 CSCL 20A

Duration coefficient were calculated for Boeing 747 and T-38 airplanes for sound exposure level (SEL) and effective perceived noise level (EPNL) scales. The measured SEL duration coefficients were 8.4 for the Boeing 747 and 5.5 for the T-38 result was in good agreement with a previous result for a similar F-5 airplane. In EPNL, the duration coefficients were 7.2 for the Boeing 747 and 5.7 for the T-38. The difference in the results between the two airplanes is believed to be due to their different engine noise source spectra. The difference in the Boeing 747 results in the two different metric was due to the different frequency weighting of A-weighted sound pressure level, used in SEL, and tone-corrected perceived noise level, used in EPNL, when applied to the 747 spectra. B.W.

N82-12023# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

ON THE KERNEL FUNCTION COLLOCATION METHOD IN STEADY SUBSONIC FLOW FOR WING WITH CONTROL SURFACES

Chen Jing Song *In its* Acta Mech. Sinica (Selected Articles) (FTD-ID(RS)T-0705-81) 15 Sep. 1981 p 35-50 refs Transl. into ENGLISH from Acta Mech. Sinica (China), no. 2, 1979 Avail: NTIS HC A06/MF A01 CSCL 20/4

The forms of the lift distribution function for wings with control surfaces in steady subsonic flow are analyzed. Methods for treating kernel singularities of linear integral equations and singularities of the lift distribution function are discussed and the numerical solution to the integral equation is given. These methods may be used to calculate the lift distribution of the wing by itself or of the wing with partial or full control surfaces on both the leading and trailing edges. The numerical values agree well with experimental data and have the same accuracy as those given by other theories. As compared with the vortex lattice method, the computational storage requirement for this method is smaller and the computational time is less. The numerical computation may be carried out on smaller computers.

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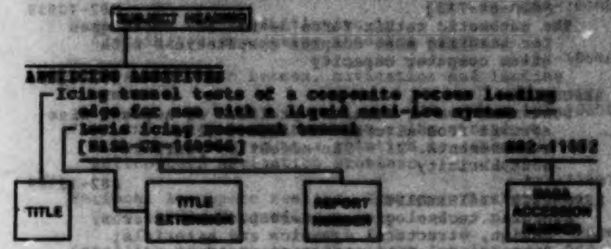

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Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980
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Acta mechanica sinica
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The arbitrary quasi-orthogonal surface method for computing three-dimensional flow in turbine machinery. 2. Calculation of the three-dimensional flow with the S sub 1-surface twisted
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Computation of high Reynolds number internal/external flows [NASA-TM-84049] N82-11046
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CONFERENCES
Test Pilots' Aviation Safety Workshop, U.S. Naval Postgraduate School, Monterey, CA, February 25-28, 1981, Proceedings A82-10500
Digital avionics - Promise and practice; Proceedings of the Joint Symposium, London, England, March 20, 1980 A82-11934
Emerging technologies in aerospace structures, design, structural dynamics and materials; Proceedings of the Aerospace Conference, San Francisco, CA, August 13-15, 1980 A82-12026
Powder metallurgy superalloys - Aerospace materials for the 1980's; Proceedings of the Conference, Zurich, Switzerland, November 18-20, 1980. Volume 1 A82-12495
National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings A82-12626
Kevlar composites; Proceedings of the Symposium, El Segundo, CA, December 2, 1980 A82-12646
The Shock and Vibration Digest, volume 13, no. 9 [AD-A105062] N82-10421
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Spin recovery training --- licensing requirement [GPO-66-020] N82-10022
Airport and Airway Improvement Act of 1981, part 1 [GPO-76-241-PT-1] N82-10062
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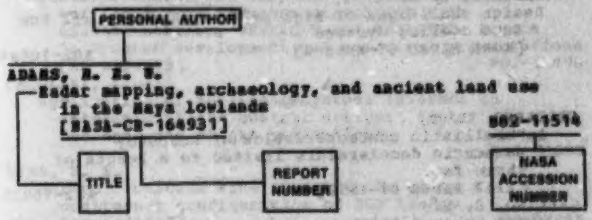

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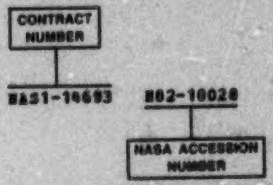

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This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 442 reports, journal articles, and other documents originally announced in February 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

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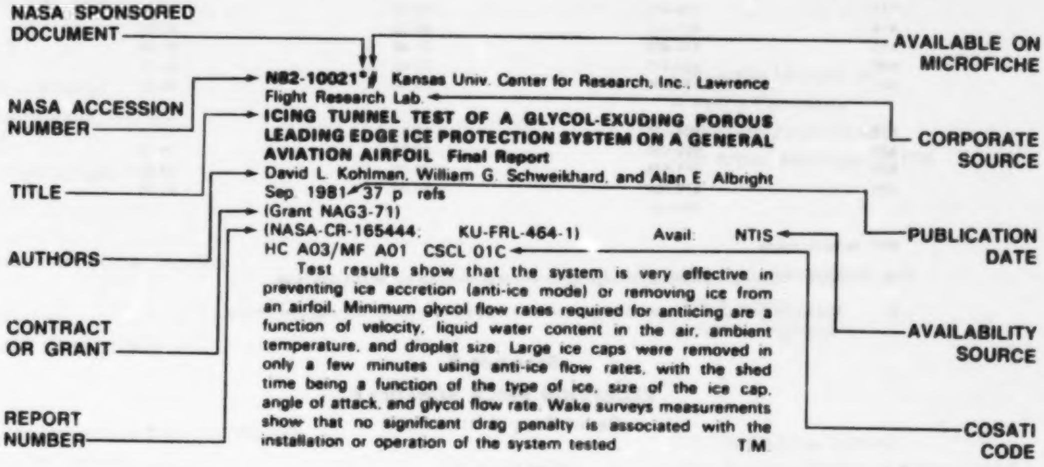

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
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Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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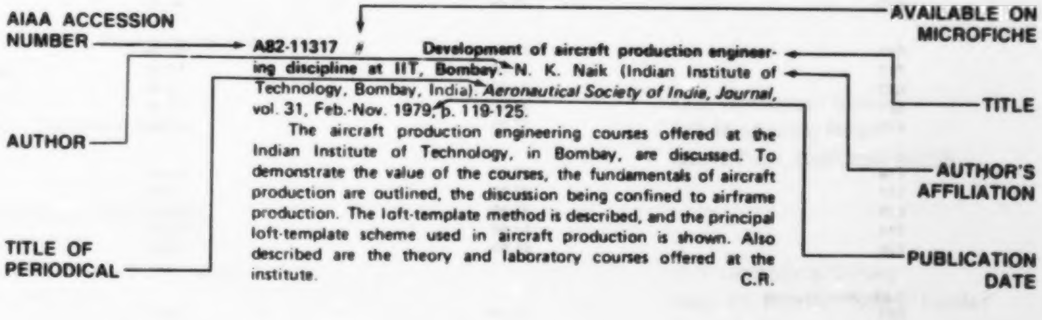

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 146)

MARCH 1982

IAA ENTRIES

A82-12987 **Creep and aero gas turbine design.** R. E. Jenkins (Rolls-Royce, Ltd., Aero Div., Bristol, England). In: International Conference on Engineering Aspects of Creep, Sheffield, England, September 15-19, 1980, Proceedings. Volume 1. London, Mechanical Engineering Publications, Ltd., 1980, p. 251-258.

Considerations given to creep in the design of aero gas turbines are reviewed. The basic requirements dictating the creep design of aero gas turbines are the attainment of the highest possible cycle temperature, consistent with the turbine cooling technology and the turbine life, and the maintenance of critical dimensions, such as clearance between rotating and static parts, throughout the service life. The importance of temperature assessment and definition and detailed analysis of typical flights is emphasized. V.L.

A82-13016 **ATARK laser tracking system.** R. Grimes and D. Baxter (Contraves Goerz Corp., Pittsburgh, PA). In: Electro-optics/Laser 80 Conference and Exposition, Boston, MA, November 19-21, 1980, Proceedings. Chicago, Industrial and Scientific Conference Management, Inc., 1980, p. 255-267.

The Automatic Tracking and Ranging Kit (ATARK) is a modular pulsed laser transceiver and electronics system suitable for a wide range of instrumentation requirements found in current programs at test ranges. The primary criterion has been to provide a system with the highest single data point accuracy. Key features of the tracker are modular construction, with processor/software control, operation at 1.06 micron, dual lamp cavity, variable pulse rate, coaxial TV system for visual record/viewing, and linear tracking error over the field of view. Using retroreflectors, the ATARK system is operational to ranges in excess of 100,000 feet and provides range data of one foot with measured tracking error of 100 microradians accuracy. P.T.H.

A82-13020 **Options for GTE precision automated tracking system.** D. Stark (GTE Sylvania, Inc., Mountain View, CA). In: Electro-optics/Laser 80 Conference and Exposition, Boston, MA, November 19-21, 1980, Proceedings. Chicago, Industrial and Scientific Conference Management, Inc., 1980, p. 302-306.

The overall design and performance of the basic PATS (Precision Automated Tracking System) and recently incorporated new features are discussed. The target tracking subsystem of PATS is a 100 pulses-per-second, 15 ns pulse-width laser transmitter and optical receiver mounted on an elevation-over-azimuth tracking mount. A quadrant photodetector is used in conjunction with an amplitude monopulse receiver to develop boresight error data. These data drive the servo system which keeps the laser pointed at the target. The absolute accuracy in azimuth and elevation is better than 0.1 milliradians, the maximum dynamics is 2.0 rad/sec, with an acceleration of 500 milliradians/sq sec. The new features include dual mode capability and automatic camera focus. V.L.

A82-13077 * **Darboux points in minimum-fuel aircraft landing problems.** E. Kreindler and F. Nauman (NASA, Ames Research Center, Moffett Field, CA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981, 5 p. (WA-1A). 13 refs.

An algorithm for suboptimal flight paths is used to show the existence of Darboux points on extremals of a fourth-order minimum-fuel horizontal aircraft landing problem; the states are two position coordinates, velocity and heading. It is shown that there is no simple relationship between Darboux points and conjugate points for a special second-order case of capturing a line at constant velocity. B.J.

A82-13078 **Fuel efficient flight profiles in an ATC flow management environment.** R. W. Schwab (Boeing Commercial Airplane Co., Seattle, WA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981, 6 p. (WA-1B).

The Flow Management research program was established to define the airborne navigation/guidance capabilities needed for efficient operation in the ATC Flow Management system under development; the Flow Management research is one element of the NASA Terminal Configured Vehicle program. This paper examines the Flow Management algorithms, and reviews in-plane geometry and ATC constraints, wind and temperature modeling, descent initialization, runway profile descent calculation, aeroperformance envelope determination, high profile descent calculation, and holding and path stretching. B.J.

A82-13079 * **A decoupled control system for improved flight performance in wind shear.** G. K. Miller, Jr. (NASA, Langley Research Center, Hampton, VA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981. 9 p. (WA-1D). 9 refs.

A fixed-base simulation study has been made to compare the approach and landing performance of a decoupled longitudinal control system and the velocity-vector control-wheel steering (VCWS) system that currently exists on the NASA Terminal Configured Vehicle (TCV). The decoupled control system employed constant prefilter and feedback gains to provide steady-state decoupling of flight-path angle, pitch angle, and forward velocity using symmetric spoilers, throttle, and elevator as active control elements. In severe wind shear, of the Kennedy-type, the decoupled control system improved both approach performance and touchdown performance even when the spoiler deflection was limited to 16 deg. On a 10-point rating scale, three research pilots rated the approach and landing task with decoupled controls as much as 3 to 4 increments better than the use of the VCWS system in severe winds. (Author)

A82-13088 **A dual input actuator for fluidic backup flight control.** M. F. Cycon, Jr. (Garrett Corp., Pneumatic Systems Div., Phoenix, AZ). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981. 8 p. (WA-8B). 5 refs.

This paper describes the application of pneumatic fluidics to obtain closed-loop position control of a high-pressure, direct-drive, electrohydraulic actuator. The fluidic control, which requires no electrical power, is a backup to the primary electronic control. Tests conducted using a prototype fluidic circuit demonstrate the feasibility of a dual input (electronic-fluidic) actuator using technologically dissimilar redundant control methods. (Author)

A82-13093 **Digital redesign of existing multiloop continuous control systems.** K. S. Rattan (Wright State University, Dayton, OH). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981. 8 p. (WP-1D). 9 refs. Contract No. F49620-79-C-0038.

A computer-aided method for converting existing multiloop continuous-data control systems into digital control systems is presented. Digital controllers are synthesized by matching the frequency responses of the digital control system to that of the continuous control system with a minimum weighted mean square error. Formulas for computing the parameters of the digital controllers are obtained as a result. An example of digitalizing existing continuous flight controller for the longitudinal YF-16 aircraft is considered and the results obtained are compared with those obtained by the Tustin transform. (Author)

A82-13094 **Digital control for flexible aircraft using reduced order models.** G. L. Slater and R. Kandadai (Cincinnati, University, Cincinnati, OH). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981, 6 p. (WP-1E). 9 refs.

A control synthesis is presented for a very flexible aircraft, and the effects on performance from different types of suboptimal approximations are compared. By examining the response at varying sample rates, it is shown that there is a tradeoff between model accuracy and computational feasibility. When the computational requirements of higher-order models are considered, the slow sample rates imposed by these requirements make the reduced order model a superior controller. B.J.

A82-13106 **Comparison between the exact and an approximate feedback solution for medium range interception problems.** J. Shinar (Technion - Israel Institute of Technology, Haifa, Israel), K. H. Well, E. Berger (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für dynamik der Flugsysteme, Oberpfaffenhofen, West Germany), and M. Negrin. In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981, 6 p. (TA-1A). 14 refs.

The forced singular perturbation technique (FSPT) is compared with a multiple shooting algorithm known for its high precision. Three-dimensional medium range air-to-air interception is formulated as a minimum-time control problem, and the formal optimal solution is outlined. The FSPT model of the original problem is introduced, and the zero-order composite feedback solution is presented. Results of the comparison for a characteristic example are discussed, and the comparison of the zero-order FSPT feedback approximation to the precise MSA solution was found to be very encouraging. B.J.

A82-13107 * **On-line optimization of aircraft altitude and flight path angle dynamics.** A. J. Calise (Drexel University, Philadelphia, PA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1. New York, American Institute of Chemical Engineers, 1981. 6 p. (TA-1B). 5 refs. Grant No. NsG-1496.

The optimization of aircraft altitude and flight path angle dynamics is addressed in a form suitable for on-line computation and control. The approach here is a direct extension of the work reported by Calise (1979), where singular perturbation methods were used to optimize position, energy and heading dynamics; it thus represents an optimal control solution that models all of the primary trajectory related dynamics. It is pointed out that the resulting algorithm can be regarded as a nonlinear feedback control law. The minimum time intercept of a fixed terminal point is used in setting the framework in which the analytical results are developed. The main theoretical result is that the dynamics, while not completely separable, can be approximated by singular perturbation methods when the control model includes relative position dynamics. C.R.

A82-13115 * **Air-to-air combat analysis - Review of differential-gaming approaches.** M. D. Ardema (NASA, Ames Research Center, Moffett Field, CA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981. 9 p. (TP-1B). 15 refs.

The problem of evaluating the combat performance of fighter/attack aircraft is discussed, and the mathematical nature of the problem is examined. The following approaches to air combat analysis are reviewed: (1) differential-turning differential game and (2) coplanar differential game. Selected numerical examples of these approaches are presented. The relative advantages and disadvantages of each are analyzed, and it is concluded that air combat analysis is an extremely difficult mathematical problem and that no one method of approach is best for all purposes. The paper concludes with a discussion of how the two approaches might be used in a complementary manner. (Author)

A82-13119 * **On matching the systems identification technique to the particular application.** W. T. Suit and M. H. Mayo (NASA, Langley Research Center, Hampton, VA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981, 8 p. (TP-4C). 21 refs.

Several maximum likelihood and multiple regression parameter estimation programs are currently being used at the Langley Research Center of the NASA to analyze aircraft flight test data. Based on this wealth of experience, the pertinent features of these programs are investigated and some of the difficulties involved in their use are discussed. By comparing computational time, data requirements and accuracy needed, a strategy for determining which program can be used to the best advantage of the flight test engineer is discussed. (Author)

A82-13120 **Determining hinge moments and empennage airload parameters from flight data for Learjet airplanes.** G. D. Park and M. H. Abla (Gates Learjet Corp., Wichita, KS). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981. 6 p. (TP-4D). 8 refs.

Gates Learjet Corporation has utilized parameter identification techniques on flight test data in various ways to substantiate the airloads analyses used in certifying its airplanes. These analyses have concentrated primarily on the empennage and include: horizontal stabilizer rolling moment; vertical tail side load; horizontal tail actuator load; elevator, rudder and aileron pilot forces; and elevator hinge moment. Using the appropriate empennage loads results in conjunction with the results obtained from the total airplane responses, the component (wing-body, vertical tail, horizontal) airplane parameters were determined. The Taylor-Iliff computer program from NASA has been shown to be a very effective and efficient technique to substantiate airload analyses. (Author)

A82-13122 **Wing/store flutter - An active adaptive control application.** C. A. Harvey (Honeywell Systems and Research Center, Minneapolis, MN). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2 New York, American Institute of Chemical Engineers, 1981. 3 p. (FA-1A). 9 refs. Research supported by Honeywell, Inc., Contracts No. F33615-77-C-3096; No. F33615-80-C-3217.

The paper briefly summarizes the results of a recent feasibility study and progress on a wind tunnel demonstration of digital adaptive control of wing/store flutter with regard to modern fighter aircraft. The design features of such a controller are examined, including sensor selection for feedback, detection, and discrimination, and two adaptive approaches, maximum likelihood estimation and self-tuning regulation. B.J.

A82-13125 * **The design of exact nonlinear model followers.** G. Meyer (NASA, Ames Research Center, Moffett Field, CA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981. 7 p. (FA-3A). 16 refs.

A practical approach to the design of control systems for strongly nonlinear, multivariable, time-dependent plants is described. The structure of the control system is that of an exact model follower. The model dynamics are decoupled, linear, constant, and of the order of the plant. The plant state and controls are transformed so that the plant, when viewed through these transformations, looks like the simple model. Regulation of disturbances is accomplished by means of the transformed state and controls. Conditions for transformability into linear models, the appropriate models, and the construction of the transformations are discussed. The approach is illustrated on a trajectory autopilot for a helicopter. (Author)

A82-13128 **An approach to robust nonlinear control design.** M. K. Sain (Notre Dame, University, Notre Dame, IN) and J. L. Peczkowski (Bendix Corp., Energy Controls Div., South Bend, IN). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981. 6 p. (FA-3D). 18 refs.

The paper examines a control philosophy that linearizes the simulation at a finite number of points over the envelope of operation, that applies linear design technique locally about each such point, and that strings all the local designs together into a global design by scheduling the resulting compensations over the envelope as a function of key physical variables, and within a broad nonlinear model following strategy. Attention is given to the relevant local model following ideas, an extension of the local comparison sensitivity concept to the model following situation, and the global model following concept. A complete illustration based on a realistic nonlinear turbojet engine simulation is presented. B.J.

A82-13142 **Fault detection for two physically separated, communicating inertial measurement units.** P. Motyka (Charles Stark Draper Laboratory, Inc., Cambridge, MA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 2. New York, American Institute of Chemical Engineers, 1981. 10 p. (FP-2B) 6 refs. Contract No. F33615-78-C-1563.

The paper develops an analytic technique for the generation of failure detection and isolation (FDI) thresholds for a tactical aircraft system with two separated IMUs. The basic problem is to select thresholds which result in the detection and isolation of failures ranging from hard (those which affect flight-control performance) through midvalue (which affect pilot display performance) and soft (which affect navigation and weapon-delivery performance). FDI is accomplished by means of the generalized likelihood test. Results are presented which show the operation of the FDI system over a realistic flight profile, which incorporates maneuvers typical of a fighter aircraft mission. B.J.

A82-13150 # **Aeronautics in China - An AIAA report.** J. Grey. New York, American Institute of Aeronautics and Astronautics (AIAA Aerospace Assessment Series. Volume 4), 1981. 201 p. Members, $20.; nonmembers, $24.

Following the normalization of relations between China and the U.S., it was agreed that the Chinese Society of Aeronautics and Astronautics and the American Institute of Aeronautics and Astronautics would undertake an exchange of scientists and engineers to initiate the process of technical communication between the two nations in the field of aeronautics. This book reports the observations of the AIAA delegation which visited various aeronautical facilities in China. The history of Chinese aeronautics is considered along with aspects of aircraft production, engine production, and aerodynamics research, development, and testing. Attention is given to materials and structures, flight testing, guidance and control, computers, university educational programs, special topics, and aspects of travelling in China. G.R.

A82-13237 **The Agusta A129.** B. Lovera (Costruzioni Aeronautiche Giovanni Agusta S.p.A., Gallarate, Italy). *Vertiflite*, vol. 26, Nov.-Dec. 1980, p. 6-9.

The design characteristics, performance capabilities and electronics systems of the A-129 light combat helicopter currently under development for Italian Army use are discussed. Attention is given to the aircraft's Integrated Multiplex System (IMS), whose functions fall into four categories: (1) the optimized interconnection of radios and navigation equipment; (2) the management of electrical power distribution, powerplant monitoring and control, and caution and warning; (3) the integration of motion sensors, digital stability augmentation systems, and flight director function; and (4) the operation of cockpit control and display elements, including flight management and radio control. The twin-turboshaft helicopter is primarily armed for the antitank role, with the TOW missile system mounted on stub wing pylons. Attention is also given to the airframe, mission equipment, and configuration flexibility of the aircraft. O.C.

A82-13238 **Public service helicopters - Is the grass greener on the other side of the fence.** T. R. Stuelpnagel. *Vertiflite*, vol. 26, Nov.-Dec. 1980, p. 10-13.

The impact on helicopter design of public service helicopter users, concerned with such tasks as law enforcement and public safety, search and rescue, wildlife and land management, fire fighting, medical services and disaster relief, is assessed in view of the present and growth markets they represent. New public service helicopter sales are estimated to be 5-10% of total commercial sales. It is recommended that public service helicopter users review their experience with each helicopter type employed and make their evaluations and requirements known to both the government and helicopter manufacturers on an annual basis. An awareness of helicopter equipment and configuration development would also be helpful, in order to propose the incorporation of features relevant to public service missions during the design phase of new helicopters, whose development cost is now on the order of $10,000 per pound of gross weight. O.C.

A82-13239 **The TADS/PNVS 'eyes' for the AH-64 attack helicopter.** B. J. Baskett, C. M. Tsoubanos, and V. M. Weiner (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *Vertiflite*, vol. 26, Nov.-Dec. 1980, p. 14-17.

The Target Acquisition Designation Sight (TADS)/Pilot Night Vision Sensor (PNVS) electrooptical subsystem of the AH-64 advanced attack helicopter is described, with attention to its Integrated Helmet and Display Sight System (IHADSS). The TADS provides the helicopter copilot/gunner with day, night, and adverse weather target search, detection and recognition capabilities by means of (1) direct view optics (DVO), (2) day television (DTV), and (3) forward looking infrared (FLIR) sighting subsystems, each subsystem being used singly or in combination depending on tactical, weather, or visibility conditions. The TADS also provides a laser designator to illuminate the target and guide HELLFIRE missiles, and a laser receiver which provides target range measurements for fire control computations. Samples of typical PNVS symbology, including heading, power management, airspeed, and radar altitude, are also given. O.C.

A82-13240 **Fatigue methodology - A technical management system for helicopter safety and durability.** L. L. Douglas. *Vertiflite*, vol. 27, Mar.-Apr. 1981, p. 14-17.

An account is given of the development since the early 19th century, of the technical disciplines comprising the field of fatigue-related structural safety as it applies to the design and maintenance of helicopters. Attention is given such milestones in the development of analytical methods for rotating machinery and vibration and flutter problems as N.O. Myklestad's (1944) 'A New Method of Calculating Natural Modes of Uncoupled Bending Vibration of Wings and other Types of Beams', as well as the related topics of the fatigue strength of materials and its improvement by surface treatment, stress concentration, cumulative damage and fatigue crack propagation. A review is also made of more recent developments in the design of fail-safe structures, the production of fracture-tough steel, aluminum and titanium alloys, and the application of composite materials to helicopter rotor blades. O.C.

A82-13241 **Heavy lift helicopters - A national technology opportunity.** G. H. Fries (Boeing Vertol Co., Philadelphia, PA). *Vertiflite*, vol. 27, May-June 1981, p. 14-17.

The mission requirements and possible design features of future heavy lift helicopters (HLH) in the 120,000 to 150,000-lb gross weight category are described. Attention is given to the military need for such helicopters in view of the U.S. Army's cancellation of the XCH-62 HLH project and the Soviet Union's reported development of the NATO code-named 'Halo' HLH, which has a lift capacity greater than that of any U.S. cargo helicopter. Consideration is given to the relative advantages of the military, 'crane' configuration and those of a full-fuselage transport design with lower aerodynamic drag and greater productivity in longer-range missions. The transport fuselage configuration is also suited for short-haul commercial passenger service, with 140-150 seats initially and 225 seats in subsequent growth versions. Development-program cooperation between the Department of Defense and NASA is recommended. O.C.

A82-13242 **The FAA's proposed helicopter certification rules.** R. G. Schlegel (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *Vertiflite*, vol. 27, May-June 1981, p. 18-21.

A response is presented by the helicopter manufacturing industry to the FAA's Notice of Proposed Rule Making NPRM 79-13, 'Noise Standards for Helicopters in the Normal, Transport, and Restricted Categories'. Among the grounds cited for rejection are: (1) the proposed regulation sets limits that are too low, and incompatible with, the capabilities of existing technology for predicting and controlling helicopter noise; (2) regulation is premature at this time, because uncertainty as to the actual noise of the helicopters affected prevents a complete analysis of the regulation's economic impact; and (3) a loss of $8 billion in sales of current helicopter models could result from implementation of NPRM 79-13, with an additional $4.8 billion sales loss due to delays in the introduction of new helicopter designs. A joint industry/government program to establish the noise levels of all helicopters affected by the regulation is recommended. O.C.

A82-13243 **Helicopter icing.** A. A. Peterson and L. U. Dadone (Boeing Vertol Co., Philadelphia, PA). *Vertiflite*, vol. 27, May-June 1981, p. 22-25.

Due to the increased Instrument Flight Rules (IFR) capabilities of modern helicopters and the associated need for all-weather clearance, the U.S. Department and Defense and FAA are emphasizing helicopter icing investigations. Of all existing helicopters, only the Bell 412 is undergoing icing certification tests, and the SA 330 PUMA alone has obtained unlimited clearance for flight in forecast icing conditions. Consideration is given to the simulation of natural icing conditions by means of (1) icing wind tunnels; (2) environmental cold chambers; (3) helicopter tie-down sites that employ natural icing; (4) hover spray rigs; and (5) in-flight spray systems. Attention is also given to rotor ice protection systems, including those that employ high-resistance electrical heating elements, inflatable boots, microwave energy, controlled vibration, and such chemical freezing point depressants as glycol. O.C.

A82-13244 **Light Airborne Multi-Purpose System.** J. M. Purtell (U.S. Navy, Washington, DC). *Vertiflite*, vol. 27, Sept.-Oct. 1981, p. 10-13.

The Light Airborne Multi-Purpose System (LAMPS) MK III is the U.S. Navy's first fully integrated ship/air weapons system, combining frigates, destroyers and cruisers as platforms with Seahawk missile-carrying helicopters for the basic ASW mission. The helicopters also provide targeting data for Harpoon surface-to-surface missiles. The LAMPS ship/air system, which will involve over 100 ships and 204 aircraft over the next 25 years, will overcome four traditional weaknesses: (1) radar horizon limits, (2) sonar discrimination limits at extended ranges, (3) the range limitations of ASW weapons, and (4) limited missile-targeting ranges. Other elements comprised by the system are secure and open HF and UHF voice channels system management and control signal processors for the analysis of tactical data, and helicopter-delivered MK-46 ASW torpedoes. O.C.

A82-13245 **Helicopter IFR - Past, present and future and future.** V. E. Albert (Petroleum Helicopters, Inc., New Orleans, LA). *Vertiflite*, vol. 27, Sept.-Oct. 1981, p. 18-20.

An account is given of the developmental history and future prospects of helicopter Instrument Flight Rules (IFR) regulatory policies, flight instruments and procedures. The development of helicopter IFR has been speeded by British North Sea offshore oil drilling operations, whose helicopter service regularly encounters severe flying conditions. Among the problems encountered in the establishment of helicopter IFR in the U.S. have been the development of route structures to support such flights in the Northeast Corridor and Gulf Coast regions, the complexity of telephone and radio relay communications with air traffic controllers, and the establishment of weather stations. At present, in addition to the installation of offshore VHF radio stations in the Gulf of Mexico, a weather observation network and a route structure have been provided. The Loran Flight Following Program being tested at Houston station will provide remote areas with traffic separation services currently available only in urban areas, while costing only as much as two VHF remote radio locations. O.C.

A82-13246 **Wire strike protection.** C. Silvious (Tennessee Valley Authority, Knoxville, TN). *Vertiflite*, vol. 27, Nov.-Dec. 1981, p. 16-19.

Consideration is given to the design requirements of, and experience to date with, helicopter wire-strike protection devices made necessary by low-altitude operations in areas with extensive electrical transmission and communication lines. The tensile strengths of electrical transmission wires varies between 5000 and 233,000 lb, averaging 27,000 lb, and may become entangled in rotating parts even if successfully broken or cut by a helicopter. In addition to the education of pilots to better recognize wire strike hazards, attention is given to the use of wire-marking devices, which are useful in daytime operations, and the design of tail-rotor, main rotor and fuselage devices for cutting through or shielding against wires. It is recommended that all three measures be taken in future strike-reduction efforts by utilities and other helicopter operators. O.C.

A82-13314 **Costs of noise nuisance from aircraft.** P. W. Abelson (McQuarie University, North Ryde, New South Wales, Australia). *International Journal of Environmental Studies*, vol. 17, no. 3-4, 1981, p. 225-232. 10 refs.

The paper summarizes the results of research into aircraft noise costs around Sydney airport. The NEF (noise exposure forecast) model of noise annoyance is shown to provide a fair index of average, but not individual, attitudes toward noise. Although property prices were found to fall only by an average of 0.4% NEF, the fall per NEF is greater for higher values of NEF and for higher income households. However, household turnover rates due to noise, and therefore the costs of moving house, were found to be higher than those predicted by the Roskill Commission for the expected third London airport. Also, householders in noisy areas experience substantial losses in householder surplus, due in part to imperfect expectations of the noise effects. (Author)

A82-13451 **Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.** Conference sponsored by the American Institute of Aeronautics and Astronautics and Institute of Electrical and Electronics Engineers. New York, American Institute of Aeronautics and Astronautics, 1981. 645 p. Members, $65.; nonmembers, $75.

Digital avionics are discussed in terms of a system integration concept, fault isolation methodology, system effectiveness, advanced designs, sneak software analysis, and the pilot's role in an automated flight deck. Specific applications for the L-1011 flight control system, for hardware/software integration on the Shuttle, for one man operation of the F/A-18 Hornet, with voice command control, and for advanced weapons systems were considered. Papers were also presented on individual components of digital avionics systems such as the MIL-STD-1750 chip set, standardization and semiconductors, fiber optics, connectors for data buses, large screen CRT touch panels, an electronic terrain map, and flat panels for future military aircraft. D.H.K.

A82-13452 # **Integrated avionics - Concepts and concerns.** D. G. Botha (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 1-9. 14 refs. (AIAA 81-2211)

It is noted that the capability of avionics technology continues to increase by an order of magnitude every few years, but overall avionic system design architecture lags in the ability to fully exploit new technology and knowledge, particularly in the partitioning of the avionics-as-a-whole into subsystems for implementation by engineers in many disciplines, and in the integration of subsystems into the whole. In this paper, it is suggested that a concerted effort is needed by the avionics community to reexamine system partitioning, considering the relationship of subsystems in the light of new operational concepts, new knowledge in information and control theory, and different concepts of integration such as multisensor information fusion and integrated control and display interface with the crew. B.J.

A82-13453 # **F/A-18A weapon system - 1976 state of the art.** R. C. Drummond (McDonnell Aircraft Co., St. Louis, MO). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 10-20. (AIAA 81-2215)

The F/A-18A system will perform both air/air and air/surface missions and has been designed for low operating and support costs through excellent reliability and maintainability. Advanced technologies include a one-man operable cockpit, using multifunction programmable CRTs and an automated hands-on-throttle-and-stick concept. Also included are a highly flexible radar using advanced digital processing and memory techniques, a programmable stores management set with multiplexed store stations, a quad-redundant electronic flight control system, and an expanded built-in-test capability. The design and performance features of the F/A-18A system are examined, and the future outlook is discussed. B.J.

A82-13455 # **Digital avionics - What a pilot expects to see.** R. A. Berube (Pan American World Airways, Inc., Miami, FL). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 28-38. 57 refs. (AIAA 81-2217)

The application of digital computers to aircraft is discussed from the pilot's point of view. Consideration is given to future digital design, human factors, cockpit instrumentation and predictive information, replication of the visual scene, display types, and performance/flight management systems. Particular attention is given to the importance of cockpit displayed traffic information. B.J.

A82-13456 # **Applications of digital avionics to commercial transport aircraft - The DC-9 Super 80 and beyond.** J. H. Shannon and J. D. McDonnell (Douglas Aircraft Co., Long Beach, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 39-46. (AIAA 81-2218)

The airlines' decade of experience with digital airborne equipment is reviewed, and some of the benefits arising from active controls, advanced cockpits, and advanced ATC systems that will be incorporated in the 1980's are described. This experience has given the airlines and manufacturers the confidence to further implement avionics systems with digital technology. The DC-9 Super 80 is now in revenue service with a digital flight guidance system, and other aircraft will soon enter service with the new ARINC 700 line of equipment. Additional benefits will be gained in the second half of the 1980's owing to both the cost-effective character of the equipment itself and the increase in efficiency of airframes and propulsion systems that can be obtained through further application of the digital equipment. B.J.

A82-13457 # **The role of avionics in the all electric airplane.** M. J. Cronin (Lockheed-California Co., Burbank, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 47-55. 22 refs. (AIAA 81-2219)

The paper examines the role of avionics in the development of the all-electric airplane (AEP) as a viable and energy-efficient transport. It is noted that avionics will play a key role in the fuel and thrust management of the advanced-technology engines of the AEP via technology such as FADEC (full authority digital engine control). Attention is also given to the important role of avionics in the flight control of future AEPs, operating with a relaxed static stability and advanced supercritical wings. The samarium-cobalt motor/generator development and the proliferating use of power electronics for engine starting/motor control are also discussed. B.J.

A82-13458 # **Fault isolation methodology for the L-1011 digital avionic flight control system.** W. B. Noble (Rockwell International Corp., Collins Air Transport Div., Van Nuys, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 56-61. (AIAA 81-2223)

The operation of and rationale for the fault isolation/data display system for the L-1011 digital avionic flight control system are described. These systems are currently in service and are, despite the usual and expected introductory problems, providing substantial maintenance benefit. The English-language format chosen for the display as well as the storing of the squawk (or event) which accompanied each fault, have been instrumental in reducing maintenance confusion and false LRU removals. Present status mode is being used to solve a number of intricate maintenance problems in minutes, which previously required hours of troubleshooting time. B.J.

A82-13463 # **Avionics implications from weapon system operational utility studies on Manned Air Combat Simulators.** N. J. Kessler and H. Passmore (McDonnell Aircraft Co., St. Louis, MO). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 85-92. (AIAA 81-2230)

The McDonnell Aircraft Company Manned Air Combat Simulator (MACS) is described. The simulator facility is discussed, and a definition of the test models is given. In addition, attention is given to the lessons learned and system modifications which evolved as a result of this type of testing. It is noted that the value of MACS has recently been demonstrated as a tool for the evaluation in a simulated combat environment of the operational utility of such systems as the Advanced Medium Range Air-to-Air Missile (AMRAAM). B.J.

A82-13465 # **Computer-in-control selection logic for a triplex digital flight control system.** P. J. Ferrell (Boeing Military Airplane Co., Seattle, WA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 97-101. (AIAA 81-2236)

The computer-in-control logic (CICL) unit is an independent monitor that ensures proper selection of one of two flight control computers to the simplex level with minimum switching. The CICL maximizes fault tolerance without being a source of a single-point failure; its implementation is simple and reliable, and its algorithm is easy to change. This paper presents a functional description of the CICL and examines potential architectural considerations. B.J.

A82-13466 * # **Application of the concept of dynamic trim control and nonlinear system inverses to automatic control of a vertical attitude takeoff and landing aircraft.** G. A. Smith and G. Meyer (NASA, Ames Research Center, Moffett Field, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 102-115. 8 refs. (AIAA 81-2238)

A full envelope automatic flight control system based on nonlinear inverse systems concepts has been applied to a vertical attitude takeoff and landing (VATOL) fighter aircraft. A new method for using an airborne digital aircraft model to perform the inversion of a nonlinear aircraft model is presented together with the results of a simulation study of the nonlinear inverse system concept for the vertical-attitude hover mode. The system response to maneuver commands in the vertical attitude was found to be excellent; and recovery from large initial offsets and large disturbances was found to be very satisfactory. B.J.

A82-13467 # **Aircraft separation assurance avionics.** R. Sobocinski (Bell Aerospace Textron, Belmont, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 116-118. (AIAA 81-2239)

Avionics sensors are under development to detect other transponder equipped aircraft. These sensors are subsets of systems postulated for the next generation aircraft. An Active BCAS system sponsored by the FAA interrogates, tracks and provides vertical collision avoidance commands. A Cockpit Display of Traffic Information (CDTI) sensor under NASA sponsorship passively detects transponder replies to ground based SSR sites. The CDTI provides a horizontal situation traffic display. This unit is being evaluated for pilot human factors interface. (Author)

A82-13468 # **Aircraft alerting systems standardization study.** G. P. Boucek, Jr., D. C. Hanson (Boeing Commercial Airplane Co., Seattle, WA), D. A. Po-Chedley (Douglas Aircraft Co., Long Beach, CA), B. L. Berson, M. F. Leffler (Lockheed-California Co., Burbank, CA), and J. F. Hendrickson (FAA, Washington, DC). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 119-128. 10 refs. FAA-supported research. (AIAA 81-2242)

The objectives of the Aircraft Alerting Systems Standardization Study were to augment the existing alerting system data base, to develop candidate alerting system concepts, to implement and validate these concepts, and to develop a set of alerting system guidelines and recommendations to standardize alerts on future electronic flight decks. This paper examines some of the more salient of these system guidelines and recommendations, which include: (1) that a functionally standardized alerting system be used on all future transport aircraft regardless of manufacturer, aircraft type, or airline operator; (2) that pilots audio/visual environment be improved by minimizing exposure to unnecessary or confusing alerts; (3) that three distinctively coded alert categories be provided to reduce uncertainty; and (4) that use be made of both visual and auditory channels to increase system effectiveness. B.J.

A82-13470 # **Design and analysis of a digitally controlled integrated flight/fire control system.** J. H. Blakelock (Applications Research Corp., Dayton, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 135-143. 7 refs. Contract No. F33615-78-C-3145. (AIAA 81-2245)

An integrated flight/fire control system including a movable gun and gimbaled line-of-sight tracker was designed using root locus techniques for the inner analog control loops and discrete analysis of the sampled-data outer control loops. The control systems designed include a pitch orientational control system with an outer attitude control loop, a beta/first time derivative of beta lateral stability augmentation system (where beta is the sideslip angle) with command yaw rate and a roll angle control system with an outer yaw attitude control loop, a velocity control system, a control loop for the movable gun, and the tracking control system. The discrete analysis was performed in the z-plane using traditional methods and in the s-plane using the Padé approximation. The gains for neutral stability and corresponding system natural frequencies predicted by both analysis techniques showed excellent correlation with the value obtained from a detailed six-degree-of-freedom hybrid simulation of the aircraft and various control systems. B.J.

A82-13471 # **Joint Tactical Microwave Landing System /JTMLS/ airborne signal processing.** R. J. Kelly and J. T. Skudrna (Bendix Corp., Communications Div., Baltimore, MD). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 144-155. 7 refs. (AIAA 81-2247)

The Joint Tactical Microwave Landing System, a lightweight transportable landing system which will provide all-weather precision approach guidance to drop zones, landing zones, and runways for MLS-equipped CTOL, STOL, VTOL, and rotary wing aircraft, is described with emphasis on the airborne avionics. It is shown how the airborne angle receiver satisfies the operational requirements by using an integrated digital avionics design and associated airframe antennas. This integrated avionics system will detect the MLS signal over a wide range of aircraft attitudes and will provide signal processing to generate lateral, vertical, and longitudinal guidance information for the complete spectrum of military FCS and cockpit displays. V.L.

A82-13472 # **LHX - An advanced avionics system design.** D. S. D'Avino (SEMCOR, Inc., Neptune, NJ) and S. S. Spiegel (SEMCOR, Inc., Moorestown, NJ). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 156-162. (AIAA 81-2249)

The paper reports results of a study which was performed with the objective of developing an avionics system concept for the LHX, an advanced Army weapons system. The preliminary results indicate that all currently defined LHX requirements for the armed scout mission are achievable using advanced technology and innovative system integration techniques. It is also shown that a one-man crew for the LHX is technically feasible. V.L.

A82-13481 * # **Have we overlooked the pilot's role in an automated flight deck.** G. G. Steinmetz, L. H. Person, and S. A. Morello (NASA, Langley Research Center, Hampton, VA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 222-227. 22 refs. (AIAA 81-2262)

Having adopted a philosophy of presenting situation information rather than command type as evidenced in flight directors and of keeping the pilot in a decision-making role, a series of simulation and flight experiments has occurred over a number of years as part of the Langley Terminal Configured Vehicle program. This paper traces the development, refinement, and integration of electronic pictorial displays, and a computer augmented velocity vector control mode. Some benefits and performances derived within the basic philosophy and information usage are brought forth in the discussion as results from the various simulator and flight evaluations are presented. (Author)

A82-13482 # **The application of large screen CRT's, touch panels, and voice to the flight stations of the 1990's.** R. L. Wasson and H. S. Archer, III (Lockheed-Georgia Co., Marietta, GA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers.
New York, American Institute of Aeronautics and Astronautics, 1981, p. 228-236. 5 refs. (AIAA 81-2263)

The paper examines how advances in technology, such as large screen displays, touch panels, and voice control affect the design of Lockheed's 1990's flight station. An integrated design embodying these concepts is presented and the advantages of such a design is explored. The paper is divided into two sections, the first addresses the inclusion of the advanced technology in the overall design of the flight station, and specific large screen display formatting, the second discusses the display/control technology necessary to implement such a design. (Author)

A82-13483 # **Electronic flight deck displays for transport aircraft.** R. A. Chorley (Smiths Industries Aerospace and Defence Systems Co., Cheltenham, Glos., England). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 237-246. 5 refs. Research supported by the Department of Industry and Ministry of Defence (Procurement Executive). (AIAA 81-2264)

Electronic flight deck and systems information displays for transport aircraft are discussed. Operational and economic advantages for military and civilian aircraft are reviewed, such as the flexibility of the display format which enables all information required for control of a transport aircraft to be displayed on the main panel, and the flexibility of the electronic system which minimizes the effects of failure within the display system. The display system configuration and the units of the electronic display system are presented, and human factors are considered. D.L.G.

A82-13484 # **F/A-18 'Hornet' - One man operability.** E. C. Adam (McDonnell Aircraft Co., St. Louis, MO). In: Digital Avionics

Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 247-251. (AIAA 81-2266)

Features of the F/A-18 fighter avionics design which allow one man operation in both fighter and attack modes are described. A CRT, along with head-up displays, provide the pilot with information essential for air-to-air, air-to-surface, and navigation modes. Pilot scan times are reduced because of information grouping and mission reliability is enhanced because of redundant image projection capabilities. The hands on throttle and stick system has an automated LOCK light for weapons delivery in a completely head-up, sensor-aided gun or missile attack. Console activity has been minimized through automation of time critical tasks. thus reducing the chances for pilot error or vertigo. A 98% failure detection and 99% failure isolation is built into the weapon system maintenance monitor panel. Operational capability is scheduled for 1983. M.S.K.

A82-13485 # **ARINC 429 digital data communications on the Boeing 757 and 767 commercial airliners.** R. K. Chun (Boeing Aerospace Co., Seattle, WA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 252-256. 5 refs. (AIAA 81-2267)

This paper will address the development and applications of the ARINC 429 digital data bus on the new generation of Boeing 757 and 767 commercial aircraft. The ARINC 429 Digital Information Transfer System (DITS) broadly defines a new digital data transmission format for avionics subsystems used in the next generation of commercial aircraft avionics applications. Boeing's development of a transmitter and receiver hybrid circuit which is compatible with ARINC 429 at the data bus interface will also be discussed. The hybrid package is hermetically sealed and designed to comply with the full range of military temperature requirements. (Author)

A82-13487 # **A polled contention multiplex system using MIL-STD-1553 protocol.** D. H. Wilson (Vought Corp., Dallas, TX). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 264-270. (AIAA 81-2271)

The polled contention mode in the Avionic Multiplex System is discussed, and a technique to pass the bus controller function between the terminals based on the activity of input data is presented. Improvements such as decreased data latency, more efficient bus utilization, and simplicity in software implementation are reviewed, and associated problems are considered. It is concluded that the use of dynamic bus allocation will have increasing significance as future systems become larger and more complex, while the polled contention mode may be a viable alternative to the command response system. D.L.G.

A82-13488 # **Avionics systems simulation for the Northrop F/A-18L aircraft.** R. A. Weeks (Northrop Corp., Hawthorne, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 271-278. (AIAA 81-2274)

A real-time, man-in-the-loop avionics systems simulation for the Northrop F/A-18L aircraft is discussed. Objectives include developing, implementing, and verifying the integration of the F/A-18L avionics systems with the human pilot. A fixed-based visual flight simulator with a high fidelity cockpit environment is used to assess pilot/system performance when subjected to multiple aircraft engagements, which provides operational characteristic simulations of the aircraft's radar, head-up display, integrated stores management, mission computer, and navigation systems. Consideration of the human pilot with the electronic systems allows early evaluations of potential problem areas, resulting in significant changes in the avionics systems. D.L.G.

A82-13490 * # **The SIFT computer and its development.** J. Goldberg (SRI International, Menlo Park, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 285-289. 8 refs. Contract No. NAS1-15428. (AIAA 81-2278)

Software Implemented Fault Tolerance (SIFT) is an aircraft control computer designed to allow failure probability of less than 10 to the -10th/hour. The system is based on advanced fault-tolerance computing and validation methodology. Since confirmation of reliability by observation is essentially impossible, system reliability is estimated by a Markov model. A mathematical proof is used to justify the validity of the Markov model. System design is represented by a hierarchy of abstract models, and the design proof comprises mathematical proofs that each model is, in fact, an elaboration of the next more abstract model. S.C.S.

A82-13498 # **The electronic terrain map - A new avionics integrator.** D. M. Small (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 356-359. (AIAA 81-2289)

The map reading process is a demanding task which can be simplified by using a digital map subsystem which accesses the information needed and presents it in a form which can be easily interpreted. An electronic map subsystem can generate perspective scenes, which are essentially computer generated images of the surrounding area, and an electronic map should be much easier to interpret. In addition, essential information from the map data base can be placed on the pilots Head Up Display, reducing the need for head down operations. Work on an all electronic map for aircraft display applications was started in 1976. The design and fabrication of an Airborne Electronic Terrain Map System (AETMS) was begun in May 1980. Requirements concerning future avionics systems are examined, and a future aircraft system is discussed. Attention is given to terrain following/terrain avoidance, threat avoidance, and navigation. G.R.

A82-13499 # **The interface of multifunction controls and displays to tomorrow's avionics.** W. G. Mulley (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 360-364. (AIAA 81-2290)

Approaches for keeping the cost of avionics systems at a lower level are considered, taking into account the use of systems which are easy to develop, produce, operate, and maintain. The solution of a maintenance problem includes operations related to recognizing a malfunction, isolating a malfunction, correcting a malfunction, verifying the correction, and documenting the maintenance action. The cockpit can be considered a computer terminal station, and it can become the maintenance shop for all the hardware in the particular aircraft. Five hardware interfaces and one software interface can completely define all hardware and software modules for the entire display and control subsystem. G.R.

A82-13500 # **An update of an integrated CNI system - TIES.** L. E. Smith and G. B. Heal (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 365-371. 9 refs. (AIAA 81-2292)

The Tactical Information Exchange System, TIES, is an integrated approach to providing the Communication, Navigation, and Identification (CNI) suite for future Naval aircraft. The system is based upon identifying the functional elements of a CNI suite and assembling them in a fashion that provides greater system reliability and availability over those currently available. TIES demonstration hardware is discussed, and the frequency conversion subsystem is considered, taking into account the HF site, the VHF/UHF site, and the Lx band site. Attention is given to the frequency division multiplex subsystem, the signal conversion subsystem, the TIES control subsystem, the data management and distribution assembly, the TIES external test, and questions regarding the further development of the TIES system. G.R.

A82-13502 # **The use of separated multifunction inertial sensors for flight control.** W. J. Luedde (McDonnell Aircraft Co., St. Louis, MO). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 377-382. (AIAA 81-2295)

The Multifunction Flight Control Reference System (MFCRS) program has the objective to verify that the outputs of inertial grade ring laser gyros and high quality accelerometers in a 'strapdown' configuration can be processed by a digital computer and used as the flight control feedback reference in a modern fighter, the F-15. To achieve these goals, a control law development study was performed to evaluate the effects of sensor location on flight control stability and performance. In addition, a redundance management algorithm, which uses parity equations, was developed to satisfy sensor selection and fault detection and isolation requirements. The MFCRS simulation model is considered, taking into account the F-15 flight control system, F-15 airframe dynamics, and an MFCRS sensor model. Attention is also given to sensor location studies, moment arm compensation studies, and aspects of simulator evaluation. G.R.

A82-13503 # **Redundancy management of skewed and dispersed inertial sensors.** D. L. Sebring (McDonnell Aircraft Co., St. Louis, MO) and J. T. Young (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 383-391. 13 refs. (AIAA 81-2296)

A redundancy management approach has been developed for strapped-down inertial instruments used as flight control reference sensors. The sensors will be installed and flight tested in a high-performance fighter aircraft (F-15) in a configuration consisting of two skewed and dispersed sensor clusters. Each cluster is an orthogonal triad of co-located, inertial-quality ring-laser gyros, and accelerometers. Two sets of logic (sensor selection and fault detection and isolation) operate in parallel, obtaining sensor selection and failure status information from stored tables. Table pointers are generated by comparing the values of parity equations to variable trip levels. An off-line, analytic computer program is used to generate the stored tables. This approach has been verified using Monte Carlo and F-15 Continuous System Modeling Program (CSMP) simulations. (Author)

A82-13504 # **Development and laboratory test of an integrated sensory system /ISS/ for advanced aircraft.** W. K. Toolan and A. M. Zislin (Grumman Aerospace Corp., Bethpage, NY). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 392-399. 8 refs. Contract No. N62269-79-C-0206. (AIAA 81-2297)

This paper presents the results of the second phase of an Integrated Sensory Subsystem (ISS) development effort performed by Grumman under contract to the Naval Air Development Center. The ISS is a combination of redundant inertial sensors, air data probes, transducers, and other flight control related sensors, interfaces, and the associated Data Handling System (DHS). The sensor data derived within the ISS meets the requirements (i.e., performance, redundancy, survivability, etc.) for Digital Fly-By-Wire (DFBW) flight control systems. The key issue of this development phase was the synthesis and development of a DHS for dispersed arrays of flight control inertial sensors subjected to dissimilar motions due to body bending of the aircraft structure. The system design is described in terms of the hardware and Data Handling System synthesis, followed by a discussion of the methods utilized to verify system performance. (Author)

A82-13505 # **Direct digital drive actuation.** L. L. Kohnhorst (Rockwell International Corp., Columbus, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 400-408. (AIAA 81-2298)

The Digital Flight Control System (DFCS) exploits the advantages of fly-by-wire mechanizations and digital technology while maintaining the demonstrated safety and reliability of manual control systems. However, the use of the DFCS would increase aircraft life cycle costs and decrease operational readiness if conventional avionic hardware configuration methods are applied to new aircraft designs. One of the programs initiated by the Navy with the objective to simplify the complexity of DFCS is related to the development of the Advanced Flight Control Actuation System (AFCAS). The AFCAS is to make use of a simplified, modular, fly-by-wire actuator. The simplified actuation can be accomplished without loss in mission reliability, but with improved mean time between failure (MTBF) because of the reduced complexity. The computer interface complexity is simultaneously reduced because of circuit requirements that are more compatible with digital technology than present day analog circuits. G.R.

A82-13506 # **Applications of head-up displays in commercial transport aircraft.** J. R. Lowe and J. R. Ornelas (Douglas Aircraft Co., Long Beach, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 409-414. 6 refs. (AIAA 81-2300)

The demanding tasks which the commercial transport pilot encounters during approach and landing are made easier by a suitable Head-Up Display (HUD) design. The HUD simplifies for the pilot tasks of decision-making, control and management. It also relieves him of the need to take his eyes from the view ahead to refer to his panel instruments. During an instrument approach, all guidance cues are available head-up whether or not any ground cues are visible. The continuously advancing state-of-the-art has improved the HUD with a larger field of view, more distinct images, and more easily followed symbology. These improvements have been made possible by advancements in HUD optic design, the use of the cathode-ray tube, the digital computer, and more sophisticated control laws. The first commercial transport HUD system in general use, now certified for the DC-9 Super 80, benefits from these improvements. G.R.

A82-13507 # **Flat panel developments for future military aircraft.** J. Brindle and W. G. Mulley (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 415-423. (AIAA 81-2302)

The four basic types of information for application in military aircraft are related to imaging or video, graphic, message, and discrete data. Various cockpit-mounted units are considered, taking into account the Head-Up Display, the Helmet-Mounted Display, the Mission Management Display and the Multifunction Programmable Keyboard. The display media employed include thin film electroluminescent devices, the light emitting diode, and the liquid crystal. Display addressing is discussed, giving attention to thin film transistor arrays, the integral silicon drive, the crossed electrode matrix, and the varistor. Plans for establishing technical requirements for each of the display system areas are also described. G.R.

A82-13508 * # **An integrated control panel utilizing a programmable varistor-multiplexed dichroic liquid crystal display.** I. J. Whitton (General Electric Co., Aircraft Equipment Div., Utica, NY). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 424-427. Contract No. NAS1-16414. (AIAA 81-2303)

Due to the conflicting demands of modern aircraft for increased systems/sensors and the decrease in cockpit panel size, weight, volume, and power, conventional discrete/dedicated methods of display and control are fast becoming obsolete. A means is sought to integrate the control and display into multifunctional programmable devices, thus giving the ability to increase system functions and yet conserve panel space. A potential solution to the control portion of the problem has come to be known as the Integrated Control Panel (ICP) approach. Flat panel display technology and controls using programmable flat panel displays with transparent capacitive touch control overlays offer the largest potential advantages. The flat panel display made of varistor-multiplexed dichroic liquid crystal (LCD) developed by GE in recent years appears to offer the ideal monochrome solution. (Author)

A82-13513 # Digital avionics display processor. E. G. Hamilton, Jr. and S. H. Petrofsky (Emerson Electric Co., St. Louis, MO). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 466-472. (AIAA 81-2311)

This paper addresses the processing and display of the ever increasing amount of data from the new and sophisticated sensors currently being planned for aircraft use. Emphasis is placed on a display processor architecture designed for a multisensor environment. Detailed architecture description and some specific display and signal processing examples are included to illustrate data flow within this architecture. (Author)

A82-13514 # Advanced display systems for crew stations of tactical aircraft. W. G. Ast and D. E. Green (Loral Corp., Loral Electronics Systems Div., Atlanta, GA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 473-481. (AIAA 81-2312)

This paper describes the architecture and system characteristics of a family of intelligent operator/machine controlled Advanced Display Systems for use in modern tactical aircraft. A distributed processing communications link facilitates this type of a self contained control/display subsystem by minimizing demand on the central mission computer and providing flexibility in crew and cockpit display/control requirements. The major items of the Advanced Display System, including the Interactive Processing Terminal, the Universal Display Generator and the displays, are described in light of their features, capabilities and applications. The system is discussed from the standpoint of data load, timing constraints, display quality, dynamic performance and human factors. (Author)

A82-13515 # Computergraphics for aircraft control. S. F. Filarsky and W. G. Mulley (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 482-485. (AIAA 81-2313)

The Command Flight Path Display (CFPD) has been developed to demonstrate the feasibility of providing attitude, altitude, direction and speed command to the pilot in the form of an electronically generated presentation of the real world flight path which should be flown. The principal objective of the CFPD is to assure the precise and effective guidance and control of piloted aircraft at all times. The display system achieves this goal by computing the desired, or 'command' flight path and the deviations of the aircraft from that path, and then presenting a graphical representation of this combined 'director' and 'orientation' information to the pilot. Complete information on the attitude, altitude, speed and direction of the aircraft is presented continuously by the CFPD, whether the aircraft is under manual or automatic flight control. Therefore, the pilot is able to control all of the vehicle's six degrees of freedom by reference to the single, integrated display. The flight path display concept may be applicable to all phases of flight eventually, but the present developmental effort is confined to earth-referenced applications. Accordingly, the feasibility demonstration was limited to three such applications: takeoff, landing and fixed-target, air-to-ground attack. (Author)

A82-13516 * # An advanced programmable/reconfigurable color graphics display system for crew station technology research. R. J. Montoya (Research Triangle Institute, Research Triangle Park, NC), J. N. England (IKONAS Graphics Systems, Inc., Raleigh, NC), J. J. Hatfield (NASA, Langley Research Center, Hampton, VA), and S. A. Rajala (North Carolina State University, Raleigh, NC). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 486-498. 6 refs. (AIAA 81-2314)

The hardware configuration, software organization, and applications software for the NASA IKONAS color graphics display system are described. The systems were created at the Langley Research Center Display Device Laboratory to develop, evaluate, and demonstrate advanced generic concepts, technology, and systems integration techniques for electronic crew station systems of future civil aircraft. A minicomputer with 64K core memory acts as a host for a raster scan graphics display generator. The architectures of the hardware system and the graphics display system are provided. The applications software features a FORTRAN-based model of an aircraft, a display system, and the utility program for real-time communications. The model accepts inputs from a two-dimensional joystick and outputs a set of aircraft states. Ongoing and planned work for image segmentation/generation, specialized graphics procedures, and higher level language user interface are discussed. M.S.K.

A82-13517 # Higher order Information Transfer Systems are coming. J. W. McCuen (Hughes Aircraft Co., Fullerton, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 499-506. 11 refs. (AIAA 81-2317)

The functions necessary for airframe/weapons system integration in advanced avionics systems are reviewed, noting the relevance to the establishment of a military standard Information Transfer System (ITS). The requirements driving the changes from older avionics systems are listed, and the importance of hierarchical interconnections in multilevel, multiplexed ITSs to provide lower level ITSs with functionally isolated communications media whenever data interchange is needed is stressed. Flow diagrams for three- and two-level ITSs are provided; a topology of the designs includes functional isolation between critical flight subsystems. New subsystems such as fire control, stores management, weapon guidance, and release will be combined into one subsystem. Independently operating subsystem bus networks will be tied together by higher order systems operating between 1-50 MHz. M.S.K.

A82-13518 # Advanced fiber optic systems for avionics applications. B. E. Kincaid (Lockheed Research Laboratories, Palo Alto, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 507-513. 27 refs. (AIAA 81-2319)

The application of fiber optic (FO) systems to avionics is considered, with emphasis on the design of electronic warfare (EW) systems requiring high-speed, real-time data transfer busing and wavelength multiplexing. Single star, three in-line star, and three fully-interconnected star FO data bus architectures are compared with respect to optical loss equations, maximum number of terminals, number of required fibers and bulkhead connectors, optical dynamic range required, and multipath levels for interconnected loop architectures. It is found that the single star configuration is optically superior to the two alternatives, although simplex stars must be added to the single star in order to lessen the installation cost and reliability disadvantages associated with the configuration's large number of fibers and the large pin count in a bulkhead connector. O.C.

A82-13519 # Light-guided information distribution systems. H. P. Lavin (General Electric Co., Aircraft Equipment Div., Utica, NY) and G. B. Harrold (GE Electronics Laboratory, Syracuse, NY). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 514-521. (AIAA 81-2320)

This paper examines the pervasiveness of light-guided communication systems into the avionics interconnect system. The capabilities and limitations of current technology are presented together with system architectural alternatives such as the use of wavelength multiplexing of time division and frequency division signals with various modulating schemes. Transducer design techniques for the conversion from electrical to optical signals and optical to electrical signals are presented with some of the limitations of conventional analytical techniques. The extension of light-guided communications into the avionics backplane enhances system growth capability and technological transparency by information broadcasting among the avionics modules. The experimental results of a preliminary light-guided backplane are presented using optics on a wire-wrap backplane to transfer digital clock, data, and control information for a maximum distribution to 40 loads. (Author)

A82-13520 * # On-board communication for active-control transport aircraft. L. D. Brock, A. L. Hopkins, Jr. (Charles Stark Draper Laboratory, Inc., Cambridge, MA), and J. L. Spencer (NASA, Langley Research Center, Hampton, VA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 522-529. Contract No. NAS1-15359. (AIAA 81-2321)

An investigation of active control communications sponsored by the NASA Langley Research Center is summarized. Particular attention is given to comparative architectures, for which a common set of requirements is generated as a baseline. Most of the requirements are aircraft functional in nature, such as stability and command augmentation, structural load relief, flight path control, flight control linkage, flight monitoring, management, navigation, engine control, and ground communication; the time element, the hazard environment, and the communications capacity estimation are also important factors. The architectures involve several communication technologies, including dedicated links, broadcast busing, and multiplex busing. The multiplex bus system provides the greatest flexibility and installation efficiency. A future homogeneous network system is also proposed, which would be fault and damage tolerant and would, with advanced technology, avoid the problems of designing a very large and flight critical multiplex bus system. J.F.

A82-13525 * # Digital detection and processing of laser beacon signals for aircraft collision hazard warning. L. M. Sweet, R. B. Miles, G. F. Russell, M. G. Tomeh, S. G. Webb, and E. Y. Wong (Princeton University, Princeton, NJ). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 563-571. 15 refs. Grants No. NCC2-94; No. NGL-31-001-252. (AIAA 81-2328)

A low-cost collision hazard warning system suitable for implementation in both general and commercial aviation is presented. Laser beacon systems are used as sources of accurate relative position information that are not dependent on communication between aircraft or with the ground. The beacon system consists of a rotating low-power laser beacon, detector arrays with special optics for wide angle acceptance and filtering of solar background light, microprocessors for proximity and relative trajectory computation, and pilot displays of potential hazards. The laser beacon system provides direct measurements of relative aircraft positions; using optimal nonlinear estimation theory, the measurements resulting from the current beacon sweep are combined with previous data to provide the best estimate of aircraft proximity, heading, minimum passing distance, and time to closest approach. (Author)

A82-13526 # An operational model of specific range for microprocessor applications in piston-prop general aviation airplanes. R. C. H. Parkinson. In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 572-579. 19 refs. (AIAA 81-2330)

This paper presents a fuel-efficient cruise performance model which facilitates maximizing specific range of General Aviation airplanes powered by spark-ignition piston engines and propellers. Airplanes of fixed design only are considered. Specific range is the ground distance the airplane flies per unit mass of fuel consumed in cruising flight. The cruise performance model determines the specific range, engine inlet manifold pressure, engine fuel-air mass ratio and engine fuel flow rate which correspond to any given values of geocentric true windspeed along track, equivalent airspeed, airplane gross weight, airplane longitudinal center of gravity position, auxiliary equipment power usage, engine rotational speed, pressure altitude and atmospheric ambient temperature. The use of the cruise performance model for maximizing specific range, with and without constraints on the airplane operation, is discussed. The cruise performance model appears suitable for airborne microprocessor implementation. Improvements in specific range, which are expected to result from implementation of the cruise performance model, are given. The principal hardware items necessary for such implementation are listed. (Author)

A82-13527 # Design and flight test of a lateral-directional command augmentation system. D. Atzhorn (USAF, Washington, DC) and R. F. Stengel (Princeton University, Princeton, NJ). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 580-592. 14 refs. Contract No. N00014-78-C-0257. (AIAA 81-2331)

Two-input/two-output lateral-directional control laws with Type 0 and Type 1 structures have been designed, analyzed, and flight-tested using the microprocessor-based digital flight control system (Micro-DFCS) installed in Princeton's Variable-Response Research Aircraft (VRA). These control laws were designed using linear-quadratic sampled-data regulator theory, and they were evaluated by U.S. Navy test pilots. Major closed-loop response features were found to be relatively insensitive to sampling rate (down to 4 sps), although flying qualities were degraded by increased sampling delay. Type 0 controllers provided satisfactory performance in flight, but the equivalent Type 1 systems were found to be unduly sensitive to disturbances and measurement noise. A novel application of the Tustin transformation proved useful in control law implementation. (Author)

A82-13529 # Fiber-optic immunity to EMI/EMP for military aircraft. M. K. Zaman (Lockheed-California Co., Burbank, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 597-599. (AIAA 81-2339)

Fiber-optic interconnect technology is specifically suited for military aircraft. This paper addresses a major factor of the fiber-optic interconnect technology, namely, the fiber-optic immunity to EMI/EMP, including power line transients and lightning strike. Transmission systems using fiber-optic cables (interconnect) are similar to those using electrical cables (balanced shielded twisted pairs), except that the output of the transmitter is used to modulate a light source. A photodetector responds to the light transmitted by the optical fiber, producing an electrical signal corresponding to the output of the modulated source. This signal can then be processed in a conventional manner in the system. In general, fiber-optic cables are not susceptible to EMI, provide good electromagnetic isolation between circuits, provide wide bandwidth, and are lightweight. Fiber-optic cable characteristics will be explored for shielding effectiveness. The EMI tests conducted to quantify the EMI benefits of fiber-optic cables in aircraft environments will also be discussed. No information related to transient radiation effects on electronics (TREE) is presented in this paper. (Author)

A82-13530 # Real-time flight management avionics software system. J. Chelini and R. H. Farmer (General Motors Corp., Delco Electronics Div., Goleta, CA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 600-607. (AIAA 81-2340)

Recently, the U.S. Air Force evaluated several varieties of Fuel Savings Advisory Systems (FSAS) including a Flight Management System (FMS) considered in the reported investigation. It is pointed out that the engineering effort to provide Flight Management Systems for commercial and military applications is extremely software intensive. To minimize software development efforts, an enlargement of the abstract computing machine was required. This resulted in the development of a kernel. A description is provided of the history associated with the development of a kernel and its use in FMS applications. It is demonstrated that through the use of solid software engineering methodology and proven operating system technology, Fuel Management System software is maintainable and error free, lending itself to a variety of configurations and demands with minimum software costs. G.R.

A82-13531 # Time-referencing of data in an asynchronous environment. B. D. Brumback (General Dynamics Corp., Fort Worth, TX). In: Digital Avionics Systems Conference, 4th, St. Louis, MO,

November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 608-613. (AIAA 81-2341)

The time-referencing of data in an avionic system that is based on asynchronous processing is discussed. The time-tag counter, provided by MIL-STD-1553B, is used to precisely define the age of data. An avionic system, which uses three asynchronous multiplex buses, is discussed as an example. A timing-uncertainty error budget is defined and the corresponding position and velocity errors are negligible when compared with the errors in a high-quality navigation sensor. (Author)

A82-13532 * # **A Loran-C prototype navigation receiver for general aviation.** R. W. Lilley and D. L. McCall (Ohio, University, Athens, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 614-620. 10 refs. Grant No. NGR-36-009-017. (AIAA 81-2329)

Investigations have been conducted regarding the techniques required for Loran-C navigation with application to the general-aviation pilot. The goal has been to produce prototype equipment for flight evaluation which will provide enroute navigation in both latitude-longitude and rho-theta coordinates and to evaluate the nonprecision approach capabilities of such equipment. In connection with the considered project, a prototype Loran-C receiver has been flight-tested using a variety of flight paths, with and without simultaneous ground radar position data collection. Attention is given to a receiver overview, an antenna preamplifier/coupler, the Loran-C receiver RF processor, the tracking loop hardware, tracking loop programming, video output, the laboratory and flight evaluation, and work currently in progress. G.R.

A82-13533 # **Advanced weapon systems - Integration technology.** M. J. Thullen (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 621-628. (AIAA 81-2213)

The Digital Avionics Information System (DAIS) is discussed. DAIS has been characterized as a system architecture which can be applied and configured for a broad class of avionics applications and missions utilizing digital technology to reduce life cycle costs by defining and developing modular hardware and software core elements and standardized interfaces which can be configured and applied to many aircraft. The DAIS approach reflects a total system concept rather than a functional subsystem or hardware oriented system. The DAIS architecture consists of federated processors communicating with each other and the other system elements through a standardized multiplex data bus. Advanced avionics concepts are discussed, taking into account information fusion, functional automation, integrated subsystems, advanced architecture, and aspects of concept validation. G.R.

A82-13534 * # **Low cost programmable multisimulator facility.** J. G. Kreifeldt (Tufts University, Medford, MA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 629-632. 7 refs. Grants No. NsG-2156; No. NCC2-93. (AIAA 81-2229)

A prototype, low cost multisimulator facility consisting of a DEC LSI-11 host computer and multiple desk top simulators is reported. The facility includes a main-frame system, a voice system, and a multi-cab system which consists of a flight panel, a host subsystem, and a flight simulator system. Software components are described, and the simulator computer, which provides flight dynamics, a path predictor, and navigation and data communications is discussed. The system may be computationally upgraded by specification of the DEC LSI-11/23, thus obtaining at least a two-fold increase in real-time computational power. D.L.G.

A82-13580 † **Divergence of a sweptforward wing (Divergentsiia kryla s obratnoi strelovidnost'iu).** A. P. Seiranian. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Tverdogo Tela*, Sept.-Oct. 1981, p. 133-138. 10 refs. In Russian.

Equations describing the divergence of a sweptforward wing are examined and found to contain a small parameter. The perturbation method for an arbitrary wing is used to obtain a formula relating the critical divergence rate with the basic characteristics of the wing. Numerical results are obtained using a variational method. P.T.H.

A82-13600 **Civil aviation in China.** R. Goodson. *Interavia*, vol. 36, Nov. 1981, p. 1098-1102.

An account is given of the present capabilities and development plans of the General Administration of Civil Aviation of China (CAAC), which has over 180 domestic routes, provides scheduled services to more than 80 Chinese cities, and operates 17 international routes. It is reported that, of the 120 airports in the People's Republic of China, only 12 can handle 707 airliner operations and less than 10 those of the CAAC's recently acquired 747SPs. Among the operational problems cited are the use of 24 different aircraft types and the acquisition cost of such advanced aircraft as the Airbus A300. Of great importance is the ability of the CAAC to purchase aviation fuel directly from the Chinese government, at prices 10-20% lower than those privately owned airlines pay. Attention is given to airport facilities, research and agricultural aircraft operations, and the effects of regional government policy. O.C.

A82-13701 † **Estimation of the efficiency of radioelectronic flight navigation systems (Otsenka effektivnosti radioelektronnykh pilotazhno-navigatsionnykh kompleksov).** M. S. Iarlykov and A. S. Bogachev. *Radiotekhnika*, vol. 36, Sept. 1981, p. 7-12. In Russian.

A method based on the theory of Markov processes is developed for estimating the efficiency of flight navigation avionics. System components are modeled with three states, which makes it possible to investigate the permanent and temporary malfunctions. Particular attention is given to the selection of a criterion for the operational efficiency of the navigation system, and to the determination of operational states of the system. B.J.

A82-13703 † **Digital signal processing on a background of rereflections for the international aircraft landing system (Tsifrovaia obrabotka signala mezhdunarodnoi sistemy posadki samoletov na fone pereotrazhenii).** A. K. Berniukov. *Radiotekhnika*, vol. 36, Sept. 1981, p. 26-29. 7 refs. In Russian.

An analysis of multibeam signals in the time-reference scanning-beam (TRSB) system is presented for the case of rereflections and minimum a priori information. Algorithms of real-time digital processing are proposed, which make it possible to discriminate the signal from the rereflection, and to measure the information parameter. B.J.

A82-13852 * # **Powered-lift takeoff performance characteristics determined from flight test of the Quiet Short-haul Research Aircraft /QSRA/.** D. W. Riddle, R. C. Innis, J. L. Martin, and J. A. Cochrane (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2409.* 14 p. 12 refs.

A powered-lift, reduced thrust takeoff performance program utilizing quiet short-haul research aircraft has been conducted. It has been shown that the powered-lift upper surface blowing concept greatly enhances aircraft takeoff performance. The improvements include: (1) takeoff field lengths may be shortened by approximately 30%; (2) Air Force critical field lengths may be shortened by approximately 60%; (3) powered lift upper surface blowing aircraft have better handling and performance characteristics than comparable conventional aircraft; and (4) the low speeds associated with powered-lift takeoff enhance safety margins. S.C.S.

A82-13853 * # **Thunderstorm hazards flight research - Program overview.** P. L. Deal, G. L. Keyser, B. D. Fisher, and N. L. Crabill (NASA, Langley Research Center, Hampton, VA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2412.* 11 p. 7 refs.

The NASA thunderstorm hazards research program, designed to study the effects of lightning strikes on the design and operation of aircraft, is described. An all-weather F-106B is instrumented to document the EM characteristics of direct and nearby strikes, measure the field parameters and analyze the ambient atmospheric content, and film the strikes; X-ray detectors are also on board, along with instrumentation for determining the frequency of visible light waveforms. Data is either recorded on-board or sent by telemetry to base, while ground based telemetry is used to direct the pilot and craft into regions of optimal lightning activity. The sensing apparatus is described, and ongoing programs to correlate different storm parameters are reviewed, along with operational procedures and safety precautions. Continued use of the craft through 152 storms and 16 direct hits, with no fatalities or circuit breaker throw, confirms the ability of metal skinned aircraft to withstand lightning strikes; data gathered from flights during 1980 are provided. D.H.K.

A82-13854 # **Enhanced F-15 air-to-ground flight demonstrations.** G. D. Gibbs (McDonnell Aircraft Co., St. Louis, MO). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2413.* 6 p.

Features designed to enhance the F-15 Eagle air-to-ground capabilities are presented. The F-15, intended to provide battlefield air superiority, has a thrust/weight ratio exceeding one-to-one; its armament systems are outlined. Built-in flexible digital avionics have allowed in-weather performance using synthetic aperture radar (SAR), high resolution mapping, and incorporation of an infrared laser sensor pod for use once in target range. The SAR has a resolution of 8.5 ft at 10 miles, suitable for detecting surface vehicles. The flight range has been extended with conformable fuel tanks, which, though adding a small drag increase beyond Mach 1, has doubled the internal fuel capacity; a full fuel load is now 5,120 gal, enough for more than a transatlantic flight. Two seven in. and four two in. CRT displays have been mounted in the aft cockpit, which now has complete flight control capability. Patch mapping, target identification, and blind bombing test flights are described. D.H.K.

A82-13855 # **The F-16/79 test program.** K. G. Timpson (General Dynamics Corp., Fort Worth, TX). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2414.* 8 p.

Flight certification testing for the F-16 fighter outfitted with a J79 engine (F16/79) is described. The use of the J79 engine required a new inlet, a new secondary air variable by-pass system, nacelle structural insulation blankets, and adaptation of the fire detection system and installation of a fire extinguishing system. The tests were concerned only with systems which were affected by the change of engine; 350 test runs were flown. Flight test procedures are outlined, chronography is provided, and instrumentation for real-time telemetry is discussed. A total of thirteen months elapsed between the decision to outfit the export version of the F-16 with a different engine and the completion of the flight certification trials; the results of the tests are now under review by the Air Force. D.H.K.

A82-13856 # **Organizing and training for innovative flight test management.** J. D. Lang (USAF, Wright-Patterson AFB, OH). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2416.* 8 p. 6 refs.

The organization and training for innovative flight test management by the 4950th Test Wing is reported. Current wing structure, methods, planned changes, and employer/employee relationships are discussed. An in-house training program to assist in the transition from old to new by enhancing attitudes and clarifying roles for improved leadership in test project and test engineering management is presented. Future emphasis is also discussed, and is to be on organizational attitude to encourage innovation and motivation to make each project succeed. D.L.G.

A82-13857 * # **Flight experience with a remotely augmented vehicle flight test technique.** K. L. Petersen (NASA, Flight Research Center, Edwards AFB, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2417.* 19 p. 7 refs.

A flight technique which uses the remotely augmented vehicle (RAV) concept is developed to flight test advanced control law concepts. The design, development and flight test validation of a RAV system mechanized on a digital fly-by-wire aircraft are described, and future applications are discussed. Flight experiments investigate complete inner loop, low sample rate, and adaptive control system mechanisms. The technique, which utilizes a ground-based FORTRAN programmable digital computer and up and down telemetry links is found to provide the flexibility necessary to effectively investigate alternate control law mechanisms in flight. D.L.G.

A82-13859 # **A technique to determine lift and drag polars in flight and their application.** A. Knaus (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2420.* 13 p.

The paper presents performance trials of the European combat aircraft Tornado, which concentrate on techniques used to measure lift and drag polars. The polars are measured by means of well adapted test instrumentation, a data reduction system, and a high calibration standard for the aircraft and engines. Steady state and dynamic test maneuvers are combined, and result in a significant reduction in flight time required to obtain sufficient data for determining zero lift drag, induced drag characteristics, and drag increments due to aircraft configuration change. Flight test results are presented, which demonstrate the advantages of the test technique, the high data quality, and the feasibility of in-flight verification over the entire angle of attack range. D.L.G.

A82-13861 # **A cost effective method for the control of roll due to side slip on a low speed aircraft.** S. Chandrashekar and N. S. Kiran (Hindustan Aeronautics, Ltd., Flight Test Dept., Bangalore, India). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2422.* 5 p. 5 refs.

Dihedral effect and its control are important for increasing damping of dutch roll, as well as reducing roll damping and unstable spiral modes. The effectiveness of setting the wing-tips at large anhedral angles to reduce the dihedral effect is demonstrated for the case of a low wing piston trainer with a positive geometric dihedral. Results of flights conducted with four wing-tip an/dihedral values showed that the effective dihedral changed its sense when the aircraft was flown with a 30 deg wingtip anhedral; this change in sense occurred at about 10 deg tip-anhedral. The method was found to be both time and cost effective compared with conventional methods. Lack of agreement with analytical estimates indicates the need to review the analytical methods, which were based on results from wind tunnel measurements. J.F.

A82-13863 # **Performance estimation from non-steady manoeuvres.** K. R. Nippress (Aeroplane and Armament Experimental Establishment, Boscombe Down, Wilts., England). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2424.* 11 p.

Data obtained from non-steady manoeuvers on modern high performance aircraft have been analysed using least squares regression techniques to produce thrust drag models of the aircraft. Predictions of level speed performance, climb performance and turning performance have been produced from the model data and compared with data obtained from traditional test methods. The results presented in this paper demonstrate that use of non-steady techniques offers the possibility of decreasing the flight time required to perform a performance evaluation to approximately one quarter of the time required by traditional steady techniques. (Author)

A82-13869 # **Navy performance modeling techniques.** R. W. Boyd (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2431.* 5 p.

Details of airframe/engine/installation models combined with flight test data to achieve accurate performance modeling are presented. The airframe performance (drag) and engine performance (thrust) have separate computer programs which accompany the components from initial design to flight testing, and are updated with each modification to the hardware. Wind tunnel and flight test measurements are input as drag parameters while engine operational parameters are input into the thrust model. Once installation has been accomplished, a flight test model is developed which must be overlaid with the data from the initial thrust and drag models. A flowchart is presented for performance modeling, and the maneuvers and acceleration tests are described; the performance model is fed into a computer with graphics capability for analysis by project engineers. M.S.K.

A82-13871 * # **HiMAT aerodynamic design and flight test experience.** N. W. Matheny (NASA, Flight Research Center, Edwards AFB, CA) and G. N. Panageas (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2433.* 18 p. 5 refs.

Consideration is given to the design phase of the highly maneuverable aircraft technology program. Design objectives are examined, noting full-scale design and the remotely piloted research vehicle. Attention is given to subsonic, transonic, and supersonic design. Design results are discussed with reference to aerodynamic efficiency, aeroelastic tailoring, and the flight test program. S.C.S.

A82-13872 # **In-flight computation of helicopter transmission fatigue life expenditure.** K. F. Fraser (Department of Defence, Aeronautical Research Laboratories, Melbourne, Australia). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2434.* 10 p. 5 refs.

Estimates of the safe fatigue life of critical helicopter transmission components may be made if in-service load data together with component fatigue data are available. Instrumentation has been developed to provide in-flight computation and indication of the current values of fatigue life expended for critical gears in single or twin-engine helicopter transmission systems. In addition basic transmission load data in the form of totalized times spent in a number of contiguous torque bands are continually updated and stored during flight. The basic load data together with values of life expenditure for critical gears for the current flight can be automatically printed out after flight. This development opens the way towards fatigue life monitoring of individual transmissions. (Author)

A82-13873 # **Advancing blade concept /ABC/ development test program.** A. J. Ruddell (United Technologies Corp., Sikorsky Aircraft Div., West Palm Beach, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2437.* 10 p. 10 refs.

The Advancing Blade Concept (ABC) rotor system derives its name from the fact that the predominant lift load at high forward speeds is carried by the advancing blades on both sides of the aircraft. Since the retreating blades are not required to carry a significant fraction of the total lift load at forward speed, the speed and load factor limitations of the conventional helicopter due to retreating blade stall are eliminated. ABC development began in 1964. The XH-19A ABC demonstrator aircraft was designed as a research tool to investigate the ABC rotor characteristics. A brief review of the concept principles is presented along with a description of the test aircraft. It is pointed out that the XH-59A flight program has completed a successful demonstration of the ABC rotor system. The XH-59A has demonstrated significant maneuver and performance improvements over conventional helicopters. G.R.

A82-13874 * # **Recent propulsion system flight tests at the NASA Dryden Flight Research Center.** F. W. Burcham, Jr., L. P. Myers, J. Nugent, P. L. Lasagna, and L. D. Webb (NASA, Flight Research Center, Edwards AFB, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2438.* 13 p. 13 refs.

The article presents a summary of the propulsion system tests conducted on a number of aircraft at the NASA Dryden Flight Research Center. The tests included digital engine control systems, engine-inlet compatibility, inlet-airframe interactions, nozzle-boattail drag and advanced turboprop acoustics. Among the aircraft evaluated were the F-15, HiMAT, F-14, and the JetStar. S.C.S.

A82-13875 # **C-5A unsurfaced taxi and off-load demonstrations.** R. A. W. Brown (Lockheed-Georgia Co., Engineering Flight Test Div., Marietta, GA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2439.* 10 p.

The results of tests to evaluate the C-5A maneuvering and off-load capabilities on unsurfaced soils are presented. Clay-sand, sand, and silty clay soils with a CBR of nine were chosen for runways for the 665,000 lb fully loaded vehicle. Weight was gradually built up to the maximum, using a field with drop-offs no greater than six in. and driving at 5-10 knots. Conditions were created for dry sand, wet ground, snow, and frozen soil. Maneuvering was accomplished in ruts up to 8 in. deep in loose sand and 15-21 in. deep in snow; towing was not considered essential because the C-5A has rolling, rather than powered, wheels. The C-5A was judged operable under the test conditions, and recommendations are given for expanding the number of airfields available for the C-5A by using methods developed in the present tests as reference marks for soil evaluation. D.H.K.

A82-13876 # **The Cessna T303 Crusader.** T. E. Wallis and M. O. Schlegel (Cessna Aircraft Co., Wichita, KS). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2440.* 7 p.

The Cessna T303 Crusader is a six-place twin with a gross weight of 5150 pounds and an IFR equipped useful load of over 1850 pounds. Extensive initial computer and wind tunnel studies have resulted in an airplane with truly superb flying qualities. A cruciform tail configuration with a high aspect ratio horizontal tail, and advanced flow control devices in critical areas contribute much to these characteristics. The turbocharged 250 bhp engines have a unique turbocharger/compression ratio combination which provides excellent fuel economy. The paper describes the airplane and the development and certification flight test program. (Author)

A82-13877 # **Government testing.** J. C. O'Connor (U.S. Army, Aviation Research and Development Command, St. Louis, MO. *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV. Nov. 11-13, 1981, AIAA Paper 81-2443.* 4 p.

The Department of Defense Directive on Test and Evaluation establishes the policy of conducting test and evaluation throughout the acquisition process of a defense weapon system. The acquisition process consists of four distinction phases, with each phase requiring a particular scope and type of test. This paper addresses the flight testing required for each acquisition phase during the development and production of Army aircraft. The test objectives, scope of tests, and test methodology are presented for the Preliminary Airworthiness Evaluation, Developmental Tests, Operational Tests, artificial/natural inflight icing, climatic laboratory tests, and the Airworthiness and Flight Characteristics Tests. (Author)

A82-13878 * # **Flight test method for the determination of reciprocating engine cooling requirements.** S. J. Miley, E. J. Cross, Jr. (Texas A & M University, College Station, TX), and D. L. Lawrence (Piper Aircraft Corp., Lakeland, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2446.* 6 p. Grant No. NsG-1083.

It is pointed out that the effective cooling of aircraft reciprocating engines is still a problem area for the general aviation industry. Miley et al. (1981) have reported the results of an investigation of problems associated with cooling and installation aerodynamics. A description is given of a flight test procedure which was developed in connection with the considered investigation. It is shown that the test procedure provides valid cooling requirements data for a particular installation. The data are in terms of easily measurable parameters. The employment of the test procedure, which is based on the NACA cooling correlation method, can lead to more effective cooling installations and the solution of existing cooling problems. G.R.

A82-13879 # **Performance assessment of an advanced reheated turbo fan engine.** V. Zeidler (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2447.* 15 p.

Testing and evaluation techniques for rating the performance of an advanced reheated turbofan engine are reported. Thrust, specific fuel consumption, and engine operational qualities are calculated for input into a computer. Thrust evaluation requires gross thrust and air mass flow measurements, which are taken as far as possible downstream from the engine, and are linked as input. Other options for thrust evaluation are described, noting that each possesses slight degradations in accuracy. Calibration curves are diagrammed for each option, and the performance evaluation of convergent nozzles is outlined. Calibration runs are performed in an altitude test facility (ATF) with totally controlled inputs to simulate the conditions in which test flights will be flown. Highest accuracy is obtained using linked methods and two engines in the ATF for performance and aircraft drag evaluation. M.S.K.

A82-13880 * # **Selected stability and control derivatives from the first Space Shuttle entry.** K. W. Iliff, R. E. Maine (NASA, Flight Research Center, Edwards, CA), and D. R. Cooke (NASA, Johnson Space Center, Houston, TX). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2451.* 16 p. 10 refs.

Primary stability and control derivative estimates garnered from the first Shuttle entry are reported. The craft was the first vehicle to maneuver over a wide range of hypersonic velocities, yielding data on flight characteristics from previously unexplored regimes. The flight envelope was confined to entry and safe landing, with no additional maneuvers to gain control data. Data for a Mach number range of 25-1.5 and altitudes of 515,000-50,000 ft are provided, and functional ranges of the Shuttle control surfaces and attitude jets are outlined. On-board systems gathered data on aerodynamic coefficient identification, flight condition and Euler angles, and jet chamber pressures. A maximum likelihood estimation program, which contained unknown stability and control derivatives, was used for control; a control input determined the value of the unknown derivatives, and the input and spacecraft response were measured. Longitudinal and lateral directional maneuvers and their derivative estimates are described, noting wind contamination of the sideslip measurements below Mach 3. Further maneuvering and stability tests are projected for subsequent flights. M.S.K.

A82-13881 # **Planning a helicopter flight test program.** K. Kuppuswamy and N. S. Kiran (Hindustan Aeronautics, Ltd., Flight Test Dept., Bangalore, India). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2381.* 6 p.

A study has been undertaken to assess the feasibility of completing the flight test program for the three different prototypes of the Advanced Light Helicopter, a high-performance twin-jet craft designed to operate under Indian conditions, within the 30 months allotted for the purpose. It was found that in order to achieve the 1000 hours of flight time required, all prototypes must carry identical instrumentation packages capable of making about 100 different dynamic, quasi-static and identifying measurements, with a fourth package as backup. Analysis of the weight of such an instrumentation package indicates it to contribute about 400 kg to the weight of the helicopter, with one third of the total represented by cables and connectors. Cost estimates reveal over 50% of the program cost per flight hour to be accounted for by insurance and depreciation, while the more controllable engineering and flying costs make up only 33% of the total. Finally, a study of expected reliability, availability and maintainability of the test vehicle, airborne data acquisition system and telemetry system reveals that they are compatible with the planned schedule. S.C.S.

A82-13888 # **Recent improvements at the Naval Air Test Center for increased test system flexibility.** T. F. Coyle, G. A. Davis, and G. R. Ryan, Jr. (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2392.* 10 p.

Improvements that have been made in two real-time systems used daily at the Naval Air Test Center are described. The systems are the Real-time Telemetry Processing System (RTPS) and Range Computation and Control System (RCCS). The improvements have made possible (1) rapid changes to real-time application programs; (2) increased flexibility in data reduction; (3) increased capability in data analysis; and (4) increased capability in range control systems. It is pointed out that these improvements will enable the RTPS and the RCCS to provide the necessary support for the test and evaluation of both vehicles and mission systems at the center in the 1980's. C.R.

A82-13891 # **Flight testing the nonmetallic spline coupling technology at the Naval Air Test Center.** P. F. Zalesak, Sr. (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2405.* 12 p. 18 refs.

Results of a flight test program are discussed and data are presented in support of the contention that the nonmetallic spline coupling technology can be used to reduce unwanted oscillatory torsional loads transmitted between components. It is shown that the nonmetallic spline coupling technology can be applied to existing hardware systems to improve the reliability of components used to transmit torque. In the test, transmitted torsional load data, as measured at the engine driven compressor test drive shaft, were collected during several flight phases, including takeoff, takeoff abort, negative torque system check, loiter flight conditions at 500 feet and 200 knots indicated airspeed, inflight engine shutdown, inflight engine start up, landing and ground backing up operations. C.R.

A82-13892 # **Commentary on facilities used in the development of a Sea Harrier all weather operations capability.** J. W. Britton (Royal Aircraft Establishment, Bedford, England). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2407.* 8 p.

The resolution of difficulties inherent in developing an all-weather V/STOL aircraft (Sea Harrier) for sea operations is described, along with the test facilities used for the program. Reduced visibility, which restricts pilot instrument use after a certain point while landing, were explored with flight simulators with four-axis motion. The simulator provided motion fidelity, head-up displays, realistic visual and environmental conditions (digital computer controlled), and a TV video system. Additional flight test use was made of a Harrier two-seater equipped with blinds to alter visibility. Visual guidance aids comprising flashing red and white lights and runway markers were employed to provide strong visual cues for pilot orientation during approach. The advantages of having all equipment on-site are stressed, as data from one test is then available for simultaneously run test phases. D.H.K.

A82-13894 # **Information technology and its impact on test and evaluation at the Naval Air Test Center.** R. K. Fairfax, T. C. Lancaster, and G. F. Hurlburt (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2396.* 7 p. 13 refs.

An investigation is conducted regarding the approaches used by the Naval Air Test Center to provide data collection, reduction, and computer support requirements for full-scale aircraft development programs such as the F/A-18, AV-8B, and LAMPS MK-III. Aspects of initial real-time development are discussed, taking into account network components, the data transmission network, the fiber optic cable, the interface equipment, the real-time processor, telemetry application, questions of range application, and problems of graphics application. A description of a satellite communications demonstration is also provided. G.R.

A82-13898 # **Georgia Tech coherent jammer flight test.** H. W. Andrews and D. L. Gordon (Georgia Institute of Technology, Atlanta, GA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2452.* 7 p.

A test program to accurately measure the interaction between a coherent jammer and a radar is described. Theoretical calculations comprised finding closed form solutions for the jammer/radar interaction, and considered slant range antenna patterns, radar cross section, frequency, polarization, and scenario geometry, in addition to the development of computer programs to study electronic countermeasures techniques. A jammer was devised to meet the specifications derived from the analytical work and mounted on a test aircraft with 14 track analog pulse-to-pulse recording equipment.

The data acquisition systems and data flow are diagrammed and experimental procedures are outlined for a radar pulse ratio frequency of 2800 Hz and a pulse width of 0.5 microsec. The plane will follow head-on, zig-zag, and constant off-set flight paths toward the radar to test the jammer capabilities. D.H.K.

A82-13903 # **Fleet Flight Loads Survey monitoring and analysis techniques.** D. A. Rakin (Grumman Aerospace Corp., Bethpage, NY). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2461.* 12 p.

The F-14 Fleet Flight Loads Survey program collected data from operational fleet aircraft for the generation of full-scale fatigue test spectra and fatigue design criteria. Thirty-five channel tape recorders were installed in each of four fleet aircraft to measure aircraft kinematic parameters, surface position, and airframe strains. Computer software was developed to reduce the data to the form of exceedance plots and bivariate exceedance tabulations. Regression equations were generated from structural flight test data and used to generate exceedance plots of major airframe surface loads. J.F.

A82-13906 * # **Flight test experience with high-alpha control system techniques on the F-14 airplane.** J. Gera, R. J. Wilson, E. K. Enevoldson (NASA, Flight Research Center, Edwards, CA), and L. T. Nguyen (NASA, Langley Research Center, Hampton, VA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2505.* 22 p. 5 refs.

Improved handling qualities of fighter aircraft at high angles of attack can be provided by various stability and control augmentation techniques. NASA and the U.S. Navy are conducting a joint flight demonstration of these techniques on an F-14 airplane. This paper reports on the flight test experience with a newly designed lateral-directional control system which suppresses such high angle of attack handling qualities problems as roll reversal, wing rock, and directional divergence while simultaneously improving departure/spin resistance. The technique of integrating a piloted simulation into the flight program was used extensively in this program. This technique had not been applied previously to high angle of attack testing and required the development of a valid model to simulate the test airplane at extremely high angles of attack. (Author)

A82-13907 # **Flight testing De Havilland Aircraft Limited DASH-8 utilizing onboard data analysis by microprocessor.** W. M. Gibson (De Havilland Aircraft of Canada, Ltd., Downsview, Ontario, Canada). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, FLight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2507.* 8 p.

The DASH-8 is a 30- to 36-passenger high-wing T-tail STOL airliner, powered by two turboprop engines driving hydromatic four-bladed propellers with full blade angle control. The aircraft is designed to meet commercial market requirements in the passenger, cargo, and executive transport roles with concentration on aerodynamic cleanliness to produce an energy efficient aircraft with low operating costs. The STOL criteria are related to requirements for a 3000 ft field length. A microprocessor was selected to perform the onboard data analysis task for the DASH-8. Attention is given to the basic instrumentation system, the microprocessor data stream interface, data analysis by onboard computer, and examples of onboard data analysis. G.R.

A82-13908 # **Application of a microprocessor controlled cockpit display for enhanced pilot control of flight test maneuvers.** M. J. Burke and E. W. Ferris (Grumman Aerospace Corp., Calverton, NY). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2510.* 4 p.

Pilot 'overshoot' of the desired flight test conditions due to malfunctioning or inadequate cockpit displays has been a continuing problem. In addition, monitoring multiple parameters during dynamic maneuvers is difficult for the pilot. Structural flight testing utilizes indirect parameter ('g') for actual structural strain values resulting in poor predictability of strain values during a maneuver. A Microprocessor Crew Display (MCDS) was generated to meet this need. It consists of a 'bargraph' light emitting diode display, two CRT's and a caution/warning light. A total of five parameters can be selected and displayed at one time. Flight experience with the MCDS indicates more precise and quicker control of the aircraft, reduced probability of 'overshoot', increased flight safety and reduced flight test time. (Author)

A82-13910 * # **Direct strike lightning measurement system.** M. E. Thomas (NASA, Langley Research Center, Hampton, VA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2513.* 8 p. 6 refs.

A research data system developed for in-flight measurement of direct and nearby lightning-strike characteristics is described. The measurement system consists of a wide-band analog recorder which records the continuous lightning scenario and fast sample-rate digital transient recorders with augmented memory capacity for increased time resolution of specific times of interest. Electromagnetic sensors with bandwidths exceeding 100 MHz are used which respond to rates of change of the quantities being measured. Data system immunity from electromagnetic interference is accomplished by the use of a dynamotor for power isolation, shielded system enclosure and fiber-optic data links. (Author)

A82-13911 # **Instrumentation to determine the suitability of RNAV systems for helicopter navigation in the national airspace system /NAS/.** J. Gallagher and R. D. Till (FAA, Technical Center, Atlantic City, NJ). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2514.* 9 p. 14 refs.

This paper describes instrumentation developed and flight testing conducted by the Federal Aviation Administration (FAA), Technical Center, to determine the suitability of RNAV systems for helicopter navigation. A data collection package consisting of a militarized minicomputer interfaced to aircraft sensors and RNAV systems typically representative of LORAN-C, GPS, Inertial Navigation, and Omega was designed and fabricated. A portable low cost position tracking system was devised for non-precision approach navigation tests by Kalman filtering post flight position data derived from a pulsed radar ranging system with inertial and air data measurements, resulting in improved position accuracy. (Author)

A82-13913 * # **Rotor systems research aircraft /RSRA/ rotor force and moment measurement system.** J. S. Burks (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2516.* 12 p.

The two Rotor Systems Research Aircraft (RSRA) are flight vehicles with unique measurement capabilities. The primary goal of the RSRA is direct measurement of rotor forces and moments in flight. This is accomplished through a rotor force and moment measurement system comprised of load cells and/or hydro-pneumatic isolator units which are integral to the aircraft structure. Due to structural flexibility, the aircraft must undergo a physical calibration. A static calibration of the first RSRA has been completed, and data analysis has progressed through determination of a linear calibration algorithm. Design, development, and operation of the RSRA rotor force and moment measurement system and the Static Calibration Facility are described, and results of the calibration are presented. (Author)

A82-13916 # **The Air Force Flight Test Center - Utah Test and Training Range in the 1980's.** C. E. Adolph (USAF, Flight Test Center, Edwards AFB, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2487.* 9 p.

The Air Force Flight Test Center (AFFTC) conducts and supports manned and unmanned aircraft flight tests, development testing of parachutes, operates the Edwards Flight Test Range, the USAF Test Pilot School and the Utah Test and Training Range. This paper summarizes the evolutionary forces in the technical and management areas which gave impetus to today's methods of operation. Current capabilities and procedures are then described, followed by a discussion of improvements planned to meet the demands of the mid to late 1980's. (Author)

A82-13917 # **The need for, and development of, a simulation facility at the Naval Air Test Center.** B. L. Hildreth and A. C. Cruce (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2488.* 9 p.

Attention is given to the problem created by, on the one hand, rapidly rising test costs and, on the other, the increasing test requirements to satisfactorily evaluate systems of ever increasing complexity. A partial solution to this problem is to raise the productivity of the testing performed in terms of quantities of data gathered per dollar or per flight hour. Four benefits of a combined flight test/simulation program are cited: improved safety, increased productivity, ability to test modern, complex, highly integrated systems, and the capability to test system performance against simulated threat environments. The requirements for a facility design based on these factors are discussed, and the current progress of the Naval Air Test Center toward developing a facility to meet these requirements is covered. C.R.

A82-13919 * # **A unique integrated flight testing facility for advanced control/display research.** V. M. Batson, J. J. Hatfield (NASA, Langley Research Center, Hampton, VA), and N. E. Novack (NASA, Wallops Flight Center, Wallops Island, VA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2490.* 11 p. 13 refs.

NASA is engaged in programs aimed at developing avionic concepts and systems technology for air transportation systems of the 1980's and beyond. A part of these programs is related to the development of advanced concepts and avionics technology for integrated displays and controls. In support of these efforts an interactive Flight Display Research System (FDRS) has been developed as an integral part of integrated flight test facilities which have been used in evaluation studies of integrated display and control concepts in support of a VTOL Approach and Landing Technology (VALT) program and current Terminal Configured Vehicle (TCV) program. A description is provided of several of the advanced integrated display and control concepts that have evolved within the VALT, TCV, and general aviation programs, as well as the integrated flight test facilities. G.R.

A82-13921 # **Collection and simulation of spatial infrared signatures of military jet aircraft.** W. D. Foster and H. I. Register (USAF, Eglin AFB, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2494.* 6 p.

The 3246th Test Wing at Eglin Air Force Base has developed airborne systems capable of collecting high resolution infrared data from ground and airborne targets. The beam approach seeker evaluation system includes test guidance units, spatial scanners, television cameras with missile track points and a laser ranger. Infrared target simulation is designed to reproduce the infrared spatial data collected by the high-resolution instrumentation system. The two approaches to this concept are the miniature filament approach and the thermochromics approach which uses VO2. S.C.S.

A82-13922 # **Flight testing the suspended maneuvering system.** R. K. Svec (McDonnell Douglas Corp., St. Louis, MO). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2498.* 8 p.

The Suspended Maneuvering System (SMS) has been developed as a rapid-response rescue vehicle that expands the capabilities and versatility of today's rescue methods. Suspended from a helicopter, the SMS is maneuvered horizontally by an onboard operator using an advanced thrust control system. This unique concept, an adaptation of modern aerospace technology, provides access to places considered inaccessible or hard to reach with conventional emergency equipment. Combating fires in high-rise buildings is one major SMS application. The flight test program concentrated on tests at a simulated high-rise building to develop the capability and techniques for 'docking' at windows and subsequent personnel entry and egress through the windows. (Author)

A82-13924 # **Improved techniques for the calibration and measurement of in-flight loads.** K. A. Birk and R. L. Kuebrich (McDonnell Aircraft Co., St. Louis, MO). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2502.* 10 p.

Techniques are presented for the calibration of strain gage bridge circuits installed in the F/A-18 wings. Methods are described which develop equations to solve for the traditional shear, bending moment, and torsional loads for a variety of flight conditions. The major improvements described are: the use of zone loading techniques to enhance strain gage slope determination from the calibration loads; the application of a family of flight equivalent distributed loads to better assess equation accuracy; and the formulation of computer aided analysis techniques which allow review of larger volume of data while requiring fewer manhours. (Author)

A82-13928 # **Overview of flight and ground testing with emphasis on the wind tunnel.** J. D. Whitefield (Sverdrup Technology, Inc., Tullahoma; Calspan Field Services, Inc., Arnold Air Force Station, TN), B. J. Griffith, R. W. Butler (Calspan Field Services, Inc., Arnold Air Force Station, TN), and C. Bang (USAF, Arnold Air Force Station, TN). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2474.* 11 p. 32 refs.

A general overview of the development of (1) aircraft and missiles, (2) the wind tunnel, and (3) the emerging role of computational techniques is given. Special comparisons between ground test data and flight data from aircraft, space vehicles, and reentry vehicles are made. The paper discusses some of the historical development of aircraft and ground testing with emphasis upon how computational fluid dynamic (CFD) techniques aid both the design and ground testing of flight vehicles. The speed regimes covered include low speed, the transonic regime, supersonic and reentry speeds. The methodology development made possible by the advent of CFD will be illustrated. Finally, likely future trends in ground test facility development, full-scale flight testing and CFD are discussed. The future role of ground testing and CFD in the development of aircraft and missiles in the 1980's and 1990's is assessed. (Author)

A82-13929 # **F-4 Advanced Avionics Flight Test.** H. A. Tracy (USAF, Eglin AFB, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2464.* 6 p.

Testing the integration of a new digital avionics navigation and weapon delivery system, including the interface with its sensors, into an aging aircraft with an analog system can be filled with problems. During previous flight tests, a 3/1 ratio of flown/productive flights was experienced. A current productivity rate approaching 100% can be related to pre-mission testing of software, and real-time display of test data. Pre-mission testing consists of loading the test software into a test simulator, and performing simulated tasks to verify operation of the test software prior to loading it into an aircraft for flight. Real-time display of test data is accomplished by inserting a software overlay into the airborne computer which outputs data to an external instrumentation pod, where the data are recorded and transmitted via microwaves to the ground control facility. The displayed data include switch settings, system errors, ground track of the aircraft, and software discretes. (Author)

A82-13930 # **F/A-18 high authority/high gain digital flight control system development and flight testing.** R. A. Burton and B. T. Kneeland, Jr. (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2465.* 8 p. 6 refs.

The F/A-18 airplane employs a fly-by-wire full authority/high gain digital flight control system (FCS) which at times can completely dominate aircraft response to pilot inputs, resulting in higher order system responses that are a new and significant challenge for the flight test engineer to analyze. This paper overviews the development of the F/A-18 digital FCS, detailing changes to the programmable read only memory (PROM) flight control laws to correct flying qualities problems. In addition, a summary of the advanced stability and control test techniques and data analysis procedures used are presented and it is demonstrated how these techniques can quantify complex changes in flight control laws. These techniques consist of a maximum likelihood parameter identification program used to perform an equivalent system analysis. Data are presented which demonstrate the success the airframe contractor has had in reducing overall system equivalent time delays. (Author)

A82-13931 * # **The development and flight test evaluation of an integrated propulsion control system for the HiMAT research airplane.** J. L. Baer-Riedhart (NASA, Flight Research Center, Edwards AFB, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2467.* 10 p. 8 refs.

The Highly Maneuverable Aircraft Technology airplane is a .44-scale version of an advanced fighter design. It is remotely piloted from a ground cockpit and is powered by a J85-GE-21 turbojet engine. The engine is electronically controlled by a digital computer onboard the airplane to operate at selected engine operation modes. The HiMAT design and development philosophy emphasized high-risk, low-cost and minimum testing, and also required that no single failure would cause loss of the vehicle. This philosophy generated unique requirements for design, computer simulation methods, specialized test techniques, and support systems which are discussed in this paper. (Author)

A82-13936 # **Comparison of low-speed handling qualities in ground-based and in-flight simulator tests.** M. F. C. van Gool (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands) and N. C. Weingarten (Calspan Advanced Technology Center, Buffalo, NY). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2478.* 9 p. 9 refs. Research supported by the Nederlands Instituut voor Vliegtuigontwikkeling en Ruimtevaart and Rijksluchtvaartdienst; Contract No. F33615-79-C-3618.

Approaches and landings have been carried out using the Total In-Flight Simulator (TIFS) to validate results of experiments on a ground-based simulator in which handling qualities of transport aircraft equipped with advanced flight control systems were the subject of investigation. The configurations featured rate-command/attitude-hold in the pitch and roll axes. Variation of equivalent short-period frequency, pitch rate overshoot, value of the normal acceleration sensitivity parameter, direct lift control, roll damping and roll time delay was studied. The results indicate that the ground-based investigation predicted the outcome of the in-flight experiments very well with the exception of the case with direct lift control in which objectionable normal accelerations were felt in flight that were not noticed during the ground-based simulation. (Author)

A82-13938 * # **Powered-lift STOL aircraft shipboard operations - A comparison of simulation, land-based and sea trial results for the QSRA.** V. C. Stevens, D. W. Riddle, J. L. Martin, and R. C. Innis (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2480.* 16 p. 10 refs.

A moving base carrier landing flight simulation using NASA's Quiet Short-Haul Research Aircraft (QSRA) was conducted during the design and fabrication of the QSRA. After completing its initial flight testing, the QSRA flew simulated carrier landings on land, followed by actual carrier landings at sea. This paper compares the simulated flight characteristics used in the flight simulation (using an aircraft math model based on wind tunnel data) with the aircraft flight characteristics obtained from flight test data. This paper also compares the results of the QSRA flight simulation carrier landings, the land based simulated carrier landings, and the actual carrier landings. (Author)

A82-13939 * # **A large-scale investigation of engine influence on inlet performance at angle-of-attack.** B. K. Hodder, B. W. Farquhar (Boeing Commercial Airlane Co., Seattle, WA), and M. R. Dudley (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2481.* 13 p. 6 refs.

A low-speed wind tunnel test was conducted in the NASA/Ames 40-x-80-foot wind tunnel to investigate the effect of engine/inlet flowfield interaction on inlet performance near flow separation. The effect of engine/inlet flowfield interaction was determined by comparing the performance of a large-scale subsonic inlet (CR = 1.26) close-coupled and remote-coupled to a TF-34 turbofan engine. The remote coupled inlet configuration removes the influence of the engine on the inlet flowfield and further, typifies conventional small-scale inlet test techniques which generally provide no simulation of turbomachinery effects. Test results indicated that engine interaction allows the inlet to operate with lower distortion levels at and beyond the separation angle-of-attack attained without engine interaction. (Author)

A82-13940 # **Naval Weapons Center - Test and evaluation in the 1980's.** R. V. Boyd (U.S. Naval Weapons Center, China Lake, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2485.* 10 p.

The Naval Weapons Center (NWC) at China Lake, CA, has test and evaluation missions that include strike weapons for land and sea targets, air-to-air systems, antiradiation missiles, and antiship missile defense systems. NWC facilities are outlined, noting current programs that comprise new warheads, propulsion systems, guidance and control units, and missiles with extended range, higher speeds, and multiple target capability. Modernization efforts comprise an on-axis data system, a real-time radar/optics system for precision space position, velocity, and acceleration measurements, a metric video TV system, a telemetry data acquisition system, upgraded range communication, timing and control systems, and airspace surveillance system enhancement. A range control center, centralized and technically current, will provide direct support for weapons testing, provide test data packaging, and be able to support several simultaneous tests. D.H.K.

A82-13941 # **Two at a time - Flight test plans for the new Boeing airliners.** B. S. Wygle (Boeing Co., Seattle, WA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2378.* 5 p.

Contracts regarding the sale of a new 200-passenger medium-range airliner and a 170-passenger short- to medium-range airliner led to a situation in which the first airliner of one type is to be delivered in January 1983, about five months after delivery of the first aircraft of the other type. The flight test programs will substantially overlap during 1982 and create an unprecedented work level during that year. To manage the work load, the company has developed a flight test computer system and a training program for engineers. Remote test sites have been selected to provide good weather conditions and low traffic levels. G.R.

A82-13942 # **Operational evaluation of the new generation of jet transport aircraft.** C. R. Foster (FAA, Seattle, WA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2377.* 12 p.

Within the Lead Region for Transport Aircraft, the FAA is upgrading its capability for operational evaluation of the new generation of transport aircraft. The responsibilities of the Certification and Flight Standards Divisions are described with emphasis on the role of the FAA's Aircraft Evaluation Groups (AEG). The AEG's ensure that the necessary FAR 121, 91, 61 and other operating rules can be met by new aircraft at the time the aircraft enter line service. The AEG's also address aircraft operations policies described in FAA advisory material, or ICAO standards for airport, facility and ATC compatibility. Specific topics covered include the type rating, training and maintenance programs, minimum equipment lists, crew workload and crew complement evaluation, and continued operational support after entry into service. (Author)

A82-13944 # **Flight test concept evolution.** L. G. Van Pelt (USAF, Eglin AFB, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2375.* 11 p.

A chronicle of progress in flight test philosophy is very revealing. Ever-increasing emphasis has been placed upon the need for flight test to be thorough and still meet the need for timely introduction of effective new aircraft into the operational inventory. Major flight test concepts (Phase Testing, Category Testing, and Development Test and Evaluation/Operational Test and Evaluation) have been influenced by nuances such as concurrency, fly-before-buy, total package procurement, prototyping, competitive fly-off, etc. An understanding of these experiences and lessons learned will help in today's preparation of effective and efficient test programs. (Author)

A82-13945 # **Electro-optical vector scoring system.** R. Rackauskas (U.S. Navy, Pacific Missile Test Center, Point Mugu, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2373.* 6 p.

An electrooptical vector scoring system has been developed for miss-distance scoring in fleet training exercises and for the testing and evaluation of weapon systems. The system utilizes solid state light emitting GaAs diodes which emit extremely short pulses of infrared radiation at 0.9 micron wavelength. The raw data obtained (range, azimuth angle, time) can be used to determine the relative velocity vector. A line drawn perpendicular to the relative velocity vector that passes through the center of the vector scoring system determines the miss distance. Score data is telemetered to a ground computer that computes velocity vector, miss distance, and the missile's attitude angle relative to the target. S.C.S.

A82-13946 * # **The development and use of a computer-interactive data acquisition and display system in a flight environment.** G. A. Bever (NASA, Flight Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2371.* 16 p. 6 refs.

The flight test data requirements at the NASA Dryden Flight Research Center increased in complexity, and more advanced instrumentation became necessary to accomplish mission goals. This paper describes the way in which an airborne computer was used to perform real-time calculations on critical flight test parameters during a flight test on a winglet-equipped KC-135A aircraft. With the computer, an airborne flight test engineer can select any sensor for airborne display in several formats, including engineering units. The computer is able to not only calculate values derived from the sensor outputs but also to interact with the data acquisition system. It can change the data cycle format and data rate, and even insert the derived values into the pulse code modulation (PCM) bit stream for recording. (Author)

A82-13947 # **Automatic digital gain ranging.** E. G. Hanson (Grumman Aerospace Corp., Bethpage, NY). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2370.* 5 p. 13 refs.

A logic circuit has been patented that automatically up-scales and down-scales digitized voice or data transmissions in response to variations in input amplitude. Although it was originally developed to compress flight test telemetry data, the circuit can also be used advantageously in 'companding' (data or voice compression and expansion) applications that are widely encountered in the communications industry. In this specialized application the circuit can be made to yield a close approximation to the 'mu-law' characteristic which is an accepted standard in this country. Complementary logic circuitry will also be described for expanding compressed digital transmissions to their original linear digital form. (Author)

A82-13948 # **The Advanced Range Instrumentation Aircraft improvement and modernization program.** J. S. Nash (USAF, Systems Engineering Branch, Wright-Patterson AFB, OH). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2368.* 4 p.

The Advanced Range Instrumentation Aircraft (ARIA), seven EC-135 aircraft configured for reception, recording and real-time relay of telemetry data, are being retrofitted with new instrumentation to meet user's requirements for mobile telemetry collection and retransmission through the turn of the century. Two sets of ARIA Prime Mission Electronic Equipment have been transferred to C-135B aircraft with TF-33 fan engines. Additional conversions will utilize Boeing 707-320Cs. Instrumentation changes include new recorders, antennas, antenna control systems, feeds, tracking systems and telemetry receivers. (Author)

A82-13949 # **Lockheed Airborne Data System - Distributed microcomputers provide on-board real-time analysis.** J. A. Tabb (Lockheed-Georgia Co., Marietta, GA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2367.* 9 p.

This paper describes the more innovative features of the Lockheed Airborne Data System (LADS), and provides some insight into the high performance and cost effectiveness realizable by use of multiple processors in real-time data systems. LADS uses multiprocessors in a highly distributed configuration to control, verify, process, analyze and display data in real-time on board the test aircraft. The approach is to use remotely located signal-conditioner/multiplexer modules controlled in groups by distributed microcomputers which preprocess all incoming data. These microcomputers are synchronously controlled by a central data station which provides digital, analog, video and graphics displays of calibrated (engineering units) data in real-time to on-board test personnel. The airborne system includes an integral analysis computer station with graphics and hard-copy for real-time analysis. (Author)

A82-13955 # **F/A-18 Flight Test program overview - 1 September 1981.** E. R. Shields (McDonnell Aircraft Co., St. Louis, MO). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2351.* 9 p.

This report presents a F/A-18 Flight Test program overview including a discussion of pre-flight planning objectives. The flight envelope expansion program proceeded, subsequent to first flight, accumulating in excess of 2,600 flight hours in 24 months. Initial shipboard trials were completed successfully aboard the USS America. Navy/Marine pilot participation provided early customer inputs to the flight development process. Currently, the flight test program is nearing completion. Service Acceptance Trials and Navy Operational Evaluation are to be conducted during 1982. (Author)

A82-13956 # **Navstar Global Positioning System flight test program overview.** A. J. MacMillan (Aerospace Corp., El Segundo, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2350.* 9 p. Contract No. F04701-80-C-0081.

The Navstar Global Positioning System (GPS), which is now in the full-scale engineering development phase, is discussed. An overview of the program, including brief descriptions of the purpose of the program and of each of the three segments (space, control, and user equipment) is given. A description is also given of the test range at Yuma Proving Ground, Arizona, including the real-time laser tracking system. The development test and evaluation phase, extending from 1977 to 1979, is described, and some of the important results are presented. C.R.

A82-13962 # **Development of a lifting parachute to provide self-dispersing capability for an Avco-designed tactical munition.** R. J. Kingsley (Avco Corp., Avco Systems Div., Wilmington, MA) and J. D. Reuter (Pioneer Parachute Co., Inc., Manchester, CT). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1928.* 9 p.

This paper describes a program of analysis and test to develop a lifting parachute to provide ground dispersion for an assemblage of tactical munitions when air launched at low altitudes. A parachute lift-to-drag ratio of 0.3 to 0.4 will provide acceptable pattern length and width. Experiments were begun with parachutes of both ribbon and cruciform designs, but unusual packaging restrictions eliminated the ribbon design. Full-scale parachutes were first evaluated for low-speed lift performance, and then tested in a transonic wind tunnel. Free flight tests were performed with a stack of four munitions using a special rail-launched booster rocket facility. The sequencing, or spacing, of each munition in a stack is a critical factor

in achieving optimum ground pattern and avoiding collision. (Author)

A82-13963 # **Theoretical analysis of wake-induced parachute collapse.** H. R. Spahr and D. F. Wolf (Sandia National Laboratory, Albuquerque, NM). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1922.* 8 p. 16 refs. Research supported by the U.S. Department of Energy.

During recent drop tests of a prototype weapon system, the parachute collapsed soon after it became fully inflated. The magnitude and duration of the collapses were severe enough to degrade parachute performance drastically. A computer-assisted analysis is presented which models parachute inflation, forebody and parachute wake generation, and interaction between the wake and the inflating or collapsing parachute. Comparison of the analysis results with full-scale drop test results shows good agreement for two parachute sizes; both parachutes were tested with and without permanent reefing. Computer-generated graphics (black and white drawings, color slides, and color movies) show the forebody and inflating parachute, the wake, and the wake and parachute interaction. (Author)

A82-13966 # **Escape systems decelerator technology.** D. N. DeSimone (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). *American Institute of Aeronautics and Astronautics, Aerodynamic Decelerator and Balloon Technology Conference, 7th, San Diego, CA, Oct. 21-23, 1981, Paper 81-1913.* 4 p.

The development of escape system technology is considered, taking into account initial ejection seat concepts during World War II, safe parachute operation following escape from the aircraft, fatality rates among ejectees, and major modification programs during the mid- to late-1960's. Advances in military parachute technology are considered, and technological problems associated with drogue stabilization parachutes are examined. Attention is given to characteristics which are commonly encountered with today's escape system decelerator. There is found to be a need for advancements in the state-of-the-art in escape system decelerator technology. G.R.

A82-13968 * # **Modeling procedures for handling qualities evaluation of flexible aircraft.** K. S. Govindaraj, B. J. Eulrich, and C. R. Chalk (Calspan Advanced Technology Center, Buffalo, NY). *Institute of Electrical and Electronics Engineers, Annual Allerton Conference on Communication, Control, and Computing, 19th, Monticello, IL, Sept. 30-Oct. 2, 1981, Paper.* 11 p. NASA-supported research; Contract No. F33615-79-C-3618.

This paper presents simplified modeling procedures to evaluate the impact of flexible modes and the unsteady aerodynamic effects on the handling qualities of Supersonic Cruise Aircraft (SCR). The modeling procedures involve obtaining reduced order transfer function models of SCR vehicles, including the important flexible mode responses and unsteady aerodynamic effects, and conversion of the transfer function models to time domain equations for use in simulations. The use of the modeling procedures is illustrated by a simple example. (Author)

A82-13969 * # **Aeroelasticity matters - Some reflections on two decades of testing in the NASA Langley Transonic Dynamics Tunnel.** W. H. Reed, III (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA). *Deutsche Gesellschaft für Luft- und Raumfahrt and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Aeroelasticity, Nürnberg, West Germany, Oct. 5-7, 1981, Paper.* 17 p. 47 refs.

In 1955, work was started on the conversion of a subsonic wind tunnel to a 16-foot transonic tunnel with Freon-12 or air as the test medium. The new facility, designated the Transonic Dynamics Tunnel (TDT), became fully operational in 1960. A description is presented of aeroelastic testing and research performed in the TDT since 1960. It is pointed out that wind-tunnel tests of aeroelastic models require specialized experimental techniques seldom found in other types of wind-tunnel studies. Attention is given to model mount systems, launch vehicle models, aircraft models, aircraft buffet, gust response, stability derivative measurements, and subcritical testing techniques. Aspects of vehicle development testing are considered along with aeroelastic 'fixes', aeroelastic 'surprises', approaches for controlling aeroelastic effects, and unsteady pressure measurements. G.R.

A82-13971 * # **The development of cryogenic wind tunnels and their application to maneuvering aircraft technology.** E. C. Polhamus and R. P. Boyden (NASA, Langley Research Center, Hampton, VA). *NATO, AGARD, Symposium on Combat Aircraft Maneuverability, Florence, Italy, Oct. 5-8, 1981, Paper.* 13 p. 20 refs.

Cryogenic wind tunnels are considered as a means of studying high Reynolds number (Re) complicated flows encountered by high maneuvering lift and high angles of attack characteristic of modern fighter aircraft. Large decreases in the viscous force while the inertial force remains constant are provided by the use of cryogenic facilities. A 2.5 m square tunnel is nearing completion at the National Transonic Facility (NTF), and will be driven by synchronous motors having a total power of 120,000 hp. The tunnel, using N2 as the cryogenic fluid, will allow large Re sweeps at constant dynamic pressure and dynamic pressure, and aeroelastic sweeps at constant Re; full altitude (air density) and acceleration force simulation will also be possible. Advances in model and strain gage balance technologies for use at the NTF are outlined, and experiments with buffet are described. M.S.K.

A82-13972 * # **The integration of control and display concepts for improved pilot situational awareness.** L. H. Person, Jr. and G. G. Steinmetz (NASA, Langley Research Center, Hampton, VA). *Flight Safety Foundation, International Air Safety Seminar, 34th, Acapulco, Mexico, Nov. 9-12, 1981, Paper.* 16 p.

Consideration is given to a part of the Langley Terminal Configured Vehicle program in which the pilot is retained as an active segment of an integrated system. The pilot is active in the outer control loop and controls the orientation of the aircraft velocity. The pilot thus has a task, but a low workload. Attention is also given to first- and second-generation primary flight display for horizontal and vertical situation awareness. S.C.S.

A82-13973 * # **Jet V/STOL wind-tunnel simulation and groundplane effects.** R. J. Margason (NASA, Langley Research Center, Subsonic Aerodynamics Branch, Hampton, VA). *NATO, AGARD, Symposium on Fluid Dynamics of Jets with Applications to V/STOL, Lisbon, Portugal, Nov. 2-5, 1981, Paper.* 22 p. 55 refs.

Low-speed wind-tunnel testing of V/STOL aircraft concepts to determine the aerodynamic-propulsion interaction effects during the transition between hover and wingborne flight is a necessary step in the development cycle of this type of aircraft. Powered models are normally used to determine the aerodynamic performance characteristics. This paper examines some of the pretest preparation necessary to define the objectives of an appropriate investigation. Several factors which influence the selection of the model concept and the engine simulator are discussed. In addition, some of the test techniques important for this class of aircraft model are examined. Finally, the paper reviews some of the wind-tunnel wall effects important to this type of aircraft testing with special emphasis on groundplane effects. (Author)

A82-13974 * # **Progress in aeronautical research and technology applicable to civil air transports.** R. E. Bower (NASA, Langley Research Center, Hampton, VA). *International Meeting on Transportation Research: State of the Art Perspectives and International Cooperation, Amalfy, Italy, Nov. 11-14, 1981, Paper.* 51 p.

Recent progress in the aeronautical research and technology program being conducted by the United States National Aeronautics and Space Administration is discussed. Emphasis is on computational capability, new testing facilities, drag reduction, turbofan and turboprop propulsion, noise, composite materials, active controls, integrated avionics, cockpit displays, flight management, and operating problems. It is shown that this technology is significantly impacting the efficiency of the new civil air transports. The excitement of emerging research promises even greater benefits to future aircraft developments. (Author)

A82-13975 # **Flight vibration optimization via conformal mapping.** F. D. Bartlett, Jr. (U.S. Army, Structures Laboratory, Hampton, VA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Paper.* 11 p. 7 refs.

An analytical approach based on the principle of conformal transformations is presented for evaluating the effects of structural dynamic changes on flight vibrations. Structural dynamic changes are characterized by discrete and multidimensional impedance adjustments. Discrete impedance changes such as point mass, colinear stiffness, and dynamic absorbers are emphasized to illustrate the practical aspects of the approach for flight vibration optimization. Conformal mapping, through inspections of complex-plane response circles, offers the capability for rapid evaluation of discrete impedance change effects on flight vibrations. The operational equations require only baseline vibration data and impedance change dynamics. Specific criteria for reducing vibrations are established using the response circle equations. In addition, the required impedance change to achieve minimum or zero vibration is uniquely defined. Flight vibration optimization is illustrated using a remote absorber in conjunction with AH-1G helicopter ground and flight vibration measurements. Vibration reduction and absorber performance are assessed at several flight conditions and airframe stations. (Author)

A82-13990 # **A set of finite elements developed for the dynamic computation of composite helicopter blades.** L. Simon (Société Alkan, Valenton, Val-de-Marne; ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Institution of Mechanical Engineers, National Engineering Laboratory, and Paisley College of Technology, International Conference on Composite Structures, Paisley, Scotland, Sept. 16-18, 1981.) ONERA, TP* no. 1981-87, 1981. 16 p. 10 refs.

The paper proposes the creation of a set of finite elements for the computation of the eigenmodes of a helicopter rotor or airscrew blade made of composite materials in rotation or at rest. Isoparametric thick shell type elements are formulated to obtain degrees of freedom on the blade airfoil skeleton. The stiffness and consistent mass elements are presented to allow the computation of the eigenmodes of the clamped structure at rest, and the convenience of discretizing the terms of the variational formulation is demonstrated. Centrifugal effects giving a centrifugal stiffness element are used to determine the quasi-static equilibrium position, which can then determine the prestress due to spinning effects. Finally, the gyroscopic eigenvalue problem is developed, and numerical results are compared with experimental results for a tilt-rotor blade aeroelastic model. D.L.G.

A82-13992 # **Application of the ONERA dynamic stall model to a helicopter blade in forward flight.** C. T. Tran (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France) and D. Falchero (Société Nationale Industrielle Aérospatiale, Marignane, Bouches-du-Rhône, France). *(Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981.) ONERA, TP* no. 1981-89, 1981. 26 p. 12 refs.

A single blade analysis for a helicopter rotor in hover and in forward flight is developed, which applies the unsteady aerodynamics of the ONERA two-dimensional dynamic stall model. The stability of the aeroelastic system is studied by means of the Floquet theory, and it is shown that the subharmonic oscillation and almost periodic oscillation of the Floquet modes can readily occur. Periodic responses for the quasi-steady and unsteady calculations are compared, and it is found that while the blade normal lift force distribution is insensitive to unsteady effects, the blade aerodynamic pitching moment and the torsional response are subjected to more influence of the unsteady aerodynamic pitching moment damping and time delay effects. It is concluded that the introduction of the blade flap and lead-leg elastic deformations should present no difficulty in principle by a modal superposition of the blade's normal modes. D.L.G.

A82-13993 # **Development of an MLS lateral autoland system with automatic path definition.** A. A. Lambregts (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Guidance and Control Conference, Albuquerque, NM, Aug. 19-21, 1981, Paper 81-1751.* 8 p. 5 refs.

The new Microwave Landing System will provide extended aircraft guidance capability in the terminal area. To utilize this capability effectively requires that the approach path be defined. This paper describes the development and simulator evaluation of an MLS lateral autoland control algorithm, using automatic path definition. The algorithm connects the initial approach path to the extended runway centerline, using straight and constant radius turn segments. The path is executed by a linear track and a novel circular turn control law to capture a straight track using MLS azimuth and DME signals. The algorithm eliminates maneuver transients when switching to MLS guidance and avoids external path definition inputs. (Author)

A82-14042 # **Aircraft absorbers - Promise and practice.** A. O. Andersson (Boeing Commercial Airplane Co., Seattle, WA). *Acoustical Society of America, Meeting, 101st, Ottawa, Canada, May 18-22, 1981, Paper.* 21 p.

Attention is given to the application of sound absorbers to aircraft engine ducts. Fan duct application is discussed with reference to the frequency spectrum of fan noise, the wave number spectrum of fan noise, and both local and extended reactions to lining types. The design of duct linings is examined, noting a number of analysis techniques for non-uniform ducts and linings. The impedence meter is considered for non-destructive testing of curved lining panels, and possibilities for mode measurements for lining design are reviewed. S.C.S.

A82-14043 # **Impedance modeling of acoustic absorbing materials for aircraft engine applications.** L. W. Dean, III (United Technologies Corp., Commercial Products Div., East Hartford, CT) and W. P. Patrick (United Technologies Research Center, East Hartford, CT). *Acoustical Society of America, Meeting, 101st, Ottawa, Canada, May 18-22, 1981, Paper.* 51 p. 65 refs.

A review of conditions under which impedance is a useful concept in solving the problem of wave propagation in a duct with flow is presented with illustrative examples. Organized procedures for modeling single and multiple degree of freedom configurations both of the lumped and distributed parameter type are discussed, and data and model predictions are compared for some specific configurations. Assumptions usually made in the modeling process are pointed out, and the effect of the assumptions, particularly on the comparisons with data, are evaluated. Improved impedance models, developed more recently, are reviewed and compared with previous models and with impedance tube data. Included in the discussion are models for bulk absorber materials compatible with aircraft engine environments. (Author)

A82-14354 **Fighters - Improving the breed.** G. Warwick. *Flight International,* vol. 120, Nov. 7, 1981, p. 1369, 1370, 1374, 1375.

Performance capability gains are projected in light of structural and weapon system modifications to the F-15 and F-16 aircraft. The conversion of the F-16 to the F-16E variant entails the addition of two fuselage plugs that lengthen the fuselage by 56 in., and the bolting on of a double-delta wing having 120% greater area than the present one. Together, these modifications increase internal fuel capacity by 82%, representing 124% greater range for the same payload. Attention is also given the staged development and retrofit of day/night, all-weather air defense and ground attack F-16 electronics. The modifications contemplated for the F-15E two-seat variant include synthetic aperture radar (SAR) and a rear cockpit equipped with CRT displays for radar, forward-looking infrared (FLIR), threat warning, and a computer-generated tactical map. O.C.

A82-14363 **Trim tab excitation system for the BAe 146.** P. Lawson (Cranfield Institute of Technology, Cranfield, Beds., England). *Aircraft Engineering,* vol. 53, Oct. 1981, p. 12.

An account is given of the design of an aileron and elevator trim tab controlled excitation system which would assist in BAe 146 control surface flight clearance trials. For the flutter trials to be valid, it was necessary to devise an excitation system which would fit into wing and tailplane structures without their modification. In order to provide an effective fail safe system against electrical or hydraulic failure, the trim tab centralizing mechanism exceeds the actuator stall load by more than 2:1, which in the case of the elevator requires about 5,000 lbs of axial thrust. The mechanism employed comprises a spring-loaded toggle linkage operating a wedge into the side of the main actuator piston. Bench tests show an adequate system response over the 1-60 Hz frequency range required. O.C.

A82-14364 **The protection of gas turbine blades - A platinum aluminide diffusion coating.** R. G. Wing (Rolls-Royce, Ltd., Leavesden, Herts., England) and I. R. McGill. *Aircraft Engineering,* vol. 53, Oct. 1981, p. 15-21. 17 refs.

The combination of high turbine operating temperatures and the presence of ingested sulphate and chloride salts in the marine environments in which ships, hovercraft and helicopters operate can lead to the costly hot corrosion of turbine blades. A discussion is presented of the use of platinum aluminide coatings to protect super-alloy turbine blades from both oxidation and hot corrosion with greater effectiveness than nickel aluminide diffusion coatings. Because of the problems of poor adherence, high porosity and hardness associated with the use of electroplating in the application of the initial platinum coating to nickel-based super-alloy blades, a fused salt platinum deposition process has been developed. The aluminizing of this base layer is conducted at temperatures below 800 C, yielding a 50-micron platinum aluminide layer of which only the outer two microns are pure, with greater depths containing a beta-nickel aluminum intermetallic. Burner rig test results in which contaminants representative of marine environment conditions are reported for the cases of two coatings produced by the new deposition method, JML-1 and -2. O.C.

A82-14365 **Attack on superalloys by chemical and electrolytic processes.** H. Simon and M. Thoma. *Aircraft Engineering,* vol. 53, Oct. 1981, p. 22-25.

In the course of such turbine aircraft engine production and overhaul surface treatment processes as electrolytic degreasing, chemical and electrochemical etching, chemical descaling and chemical stripping of thermally sprayed coatings, the precipitation-hardened nickel- and cobalt-base alloys of the highest-temperature turbine elements are subjected to corrosion. This effect is due to the carbide, nitride and carbonitride intermetallics formed by alloying elements added for precipitation hardening, which appear as inclusions of various shapes and sizes within the grain or at the grain boundaries. It is shown that these intermetallics, present as separate phases, can be dissolved out by oxidative attack. Backscattered electron and X-ray analyses of seven nickel- and cobalt-base materials lead to the conclusion that certain processes or process steps cannot be employed in production and overhaul, and alternative processing methods are suggested. O.C.

A82-14376 # **Status and tracking system for flight test data products.** R. Large, W. May, and D. O'Keefe (USAF, Flight Test Center, Edwards AFB, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2395.* 13 p.

A flight test data product status and tracking (SANDT) system has been developed and used by the Air Force Flight Test Center. Initially used in support of the Air Launched Cruise Missile Program, the SANDT has recently been applied to F-15 testing. The SANDT makes use of System 2000 Data Base Software on the Center's CDC CYBER 74 scientific computer. The paper will discuss the requirements, design alternatives, resource use, and operating experience to date. Results include improved data support planning, flexibility in supporting dissimilar flight test program, and integration of data processing with status reporting. (Author)

A82-14377 # **An advanced facility for processing aircraft dynamic test data.** D. J. Stouder (Douglas Aircraft Co., Long Beach, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2398.* 10 p.

Capabilities of the Acoustics and Vibration Data Center (AVDC) are described, using examples from various flight and laboratory tests related to commercial and military jet transports. Features such as the one-third-octave-band spectrum analysis and the narrow-band spectrum analysis, which were developed to derive noise intensity and annoyance parameters, are discussed. The paired-signal analysis for studying input-output problems, and audio presentation are also described. In addition, future developments are summarized, including the integration of the AVDC with the main flight-test data processing facility. D.L.G.

A82-14379 * # **Experience with flight test trajectory guidance.** M. R. Swann, E. L. Duke, E. K. Enevoldson, and T. D. Wolf (NASA, Flight Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2504.* 8 p. 5 refs.

A system that provides the test pilot with flight test trajectory guidance is presently evolving at the NASA Dryden Flight Research Facility. In use, this system has resulted in discernible improvements in the ease and accuracy with which pilots have approached and maintained the desired flight test conditions or trajectories. This paper describes the use of the guidance system in several past flight programs at Dryden, including the F-111 TACT program, the F-15 airframe/propulsion system interaction program, the F-15 cone transition and boundary layer experiments, and the Space Shuttle tiles flight test program. (Author)

A82-14380 # **Pave Mover Flight Test Program.** D. E. Holberg and J. F. Grabowsky (Hughes Aircraft Co., Los Angeles, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2482.* 11 p. USAF-DARPA-sponsored research.

Pave Mover is an Advanced Development Model Program performed by Hughes Aircraft Company and sponsored by the Rome Air Development Center and DARPA; it is currently under test at White Sands Missile Range, New Mexico. The system consists of an F-111E aircraft carrying a long range MTI/SAR radar and a ground based data processing and control system connected by a two-way Sperry data link. Pave Mover is the radar portion of the DARPA-conceived Assault Breaker concept demonstration designed to counter a massive attack of tank forces by radar updated surface-to-surface missiles equipped with anti-tank submunitions. During the demonstration it is also intended to track and guide air-to-surface missiles and manned attack aircraft. After a brief system description, the paper discusses flight test aspects, such as aircraft modification, the removable radar/pallet design, simulated targets, remotely controlled tank targets, missile simulation using an F-4 aircraft, the accuracy reference instrumentation, and various software simulators used in preparation for the tests. (Author)

A82-14381 * # **In-flight deflection measurement of the HiMAT aeroelastically tailored wing.** V. M. DeAngelis (NASA, Ames Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2450.* 11 p.

An electro-optical flight deflection measurement system was developed for NASA for use on the highly maneuverable aircraft technology (HiMAT) remotely piloted research vehicle (RPRV) to provide a means of evaluating the performance of the HiMAT's aeroelastically tailored composite wing and canard. A description of the flight deflection measurement system is presented from a user's viewpoint and includes the general method of operation, system capabilities and limitations, method of installation on the HiMAT vehicle, and calibration of targets. Also included is a general description of the HiMAT RPRV and its design goals. Preliminary flight deflection and bending moment data were obtained at Mach 0.8 and were extrapolated to the Mach 0.9 maneuver design condition for comparison to NASTRAN predictions and ground loads test results. The preliminary flight test results tended to agree with the results obtained from the static ground loads tests, that is, that the NASTRAN model overpredicted the streamwise twist of the composite outer wing panel. (Author)

A82-14382 * # **A review of flight-to-wind tunnel drag correlation.** E. J. Saltzman and T. G. Ayers (NASA, Flight Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2475.* 19 p. 46 refs.

Comparisons are made of wind-tunnel-model and flight drag data for various configurations representing aircraft from the mid-1940s to the 1970s. Discrepancies between model and flight data such as Reynolds number effects, wall interference, and aeroelastic problems are discussed. String support effects and the inability of models to simulate surface deflections for longitudinal trim are also studied. A wind tunnel-to-flight correlation of turbulent friction drag confirms the incompressible Karman-Schoenherr variation of turbulent skin friction with Reynolds number and the T' method for accounting compressibility effects. NASA tested 10 deg cone research indicates that model tests which are affected by tunnel noise may require the lower disturbance level environment available in flight, and it is concluded that new cryogenic facilities will improve the fidelity of model simulations of full-scale flight flow phenomena. D.L.G.

A82-14383 * # **Techniques for modifying airfoils and fairings on aircraft using foam and fiberglass.** M. B. Meyer (NASA, Flight Research Center, Edwards, CA) and F. Jiran (Fred Jiran Glider Repairs, Mojave, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2445.* 15 p. 5 refs.

The concept of using foam and fiberglass reinforced plastic to modify airfoils and fairings was applied successfully to high-speed aircraft at NASA Dryden Flight Research Center. An on-aircraft installation method was used to modify an F-15 wing glove and wing leading edge and an F-104 flap trailing edge in support of the Shuttle tile airload tests. A combination of methods, both an on-aircraft installation and an off-aircraft fabrication for installation on the aircraft, was used to modify a section of an F-111 supercritical wing with a natural laminar flow airfoil. Techniques, methods, problem areas, and recommendations are presented which indicate that using foam and fiberglass to modify airfoils and fairings on high-speed aircraft is a viable means of quickly developing airfoils and fairings with desired aerodynamic characteristics with little risk to the parent or carrier aircraft. (Author)

A82-14384 # **KC-10, flight test program management - The contractor's viewpoint.** J. L. Cook (Douglas Aircraft Co., Long Beach, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2380.* 4 p.

The management of a flight test program for the KC-10 aerial refueling tanker aircraft, which included elements of development, FAA certification and Air Force qualification and operational testing, is described. In addition to the manufacturer and the FAA, the participants included the Joint AFLC/AFCS Program Office (JPO), the Air Force Primary Test Organization, and the Air Force Test and Evaluation Center. The flight test program involved not only tanker and receiver aircraft qualifications and operational evaluations, but also air crew training, ground crew training, tech order validation, maintainability demonstrations, human factors tests, support equipment compatibility validations, cargo loading demonstrations, and acceptance test procedure validations. It was found that a division of authority between the Air Force and the FAA was highly effective, and that parallel, rather than series development testing is essential to efficient test programs. O.C.

A82-14385 # **62% manned aircraft demonstrator - Next generation trainer.** W. H. Shawler (Fairchild Republic Co., Farmingdale, NY). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2519.* 8 p.

A manned, 62% scale aircraft demonstrator designed for the Air Force's next generation trainer program is reported. Areas investigated include basic handling qualities, hinge moments on the flight control surfaces, vertical and horizontal tail loads, and spin characteristics. Results of the program are compared with wind tunnel results and scaling effects, and show good agreement with the previous data for features such as flap lift increment, aileron and rudder effectiveness, and the maximum lift coefficient. It is concluded that the 62% scale flight tests are accurate, and the concept can be used for new programs such as the NGT at a greatly reduced cost. D.L.G.

A82-14386 # **Hover tests of the XV-15 Tilt Rotor Research Aircraft.** M. D. Maisel (U.S. Army, Research and Technology Laboratories, Moffett Field, CA) and D. J. Harris (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2501.* 13 p. 5 refs.

A series of tests was conducted to investigate the hovering characteristics of the XV-15 Tilt Rotor Research Aircraft. Various wheel heights were flown to examine the effects of ground proximity. In addition to free hover, the aircraft was operated on a tie-down facility that provided a 1.8-m (6-ft) wheel-height condition. Data were obtained for hover performance both in and out of ground effect, downwash phenomena, handling characteristics as a function of hover height, and acoustics around the hovering aircraft. The results show that the XV-15 is efficient in hover and that increased control activity is required as the aircraft approaches the ground. Downwash velocities are moderate at the sides of the aircraft and relatively high fore and aft. The acoustics evaluation revealed moderate noise levels with an acceptable sound quality. (Author)

A82-14387 # **Testing capabilities of the 3246th Test Wing.** D. H. Williams, Jr. (USAF, Eglin AFB, FL). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2484.* 7 p.

The capabilities of the 3246th Test Wing at Eglin Air Force Base are reviewed, and developmental non-nuclear air armament systems and components are evaluated. The Wing's geographic location with respect to major population centers, current testing capabilities, existing instrumentation facilities, and plans for expanding the air-to-surface, air-to-air and electromagnetic capabilities are discussed. Typical missions using the multiobject tracking, ranging and control system are presented, and the seeker evaluation test system and the preflight integration of munitions and electronics systems are reported. Other future programs are discussed, which include increasingly sophisticated all-weather weapons with significantly improved multiple kill per pass hit probabilities. D.L.G.

A82-14389 # **Integrated flight testing based on nonlinear system identification data processing techniques.** J. H. Vincent and S. N. Franklin (Systems Control Technology, Inc., Palo Alto, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2449.* 11 p. 7 refs. Contract No. N00014-78-C-0641.

The results presented in this paper demonstrate the operational status of nonlinear system identification data processing techniques. Aerodynamic, installed thrust, and flight test instrumentation calibration models are identified for the F-4S from six different flight conditions which encompass a large range in angle of attack, sideslip, airspeed, control inputs, and body rotation rates. The capability for identifying nonlinear aerodynamic models in a format compatible with preflight predictions is demonstrated. A methodology for determining the accuracy of the parameters estimates is presented. (Author)

A82-14390 * # **AD-1 oblique wing aircraft program.** T. C. McMurtry, A. G. Sim, and W. H. Andrews (NASA, Flight Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2354.* 7 p.

A NASA program for evaluation of the handling and flying characteristics of the AD-1 oblique wing aircraft is discussed. The vehicle was flown to compare wind tunnel predictions with aerodynamic data, explore the control system requirements, and obtain a preliminary assessment of the aeroelastic effects. The fiberglass sandwich skin aircraft is designed for 8 g positive and 4 g negative loading at 175 knots, while the wing pivot can withstand 25 g loading. Flight monitoring was accomplished with a 41 channel pulse code modulation system for telemetry and by averaging of pilot ratings. Maneuvering tests are outlined, noting that pilot ratings indicated acceptable handling at up to 50 deg sweep. It is concluded that acceptable flying qualities can be achieved with a 60 deg sweep, and that aeroelastic tailoring can be used to satisfy cruise design technology. M.S.K.

A82-14392 * # **The use of frequency methods in rotorcraft system identification.** R. W. DuVal (NASA, Ames Research Center, Moffett Field, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981,* *AIAA Paper 81-2386.* 9 p.

A new approach to model structure determination is examined. Flight data from the Rotor Systems Research Aircraft (RSRA) are transformed into the frequency domain and truncated to provide band limiting. The stepwise regression technique is then used to identify a quasistatic state-space model from the transformed data. The data processing requirements for both time domain and frequency domain identification are discussed and the results of the two techniques are compared. (Author)

A82-14393 * # **Comparison of wind tunnel and theoretical aeroelastic predictions with flight measured airloads for the B-1 aircraft.** R. L. Sims and A. L. Carter (NASA, Flight Research Center, Edwards, CA). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2387.* 15 p. 13 refs.

An aeroelastic analysis of the B-1 aircraft was generated using the FLEXSTAB computer program. Relatively simple aerodynamic and structural models were employed. Theoretical wing and horizontal stabilizer airloads were compared to wind tunnel predictions and flight data measured during quasi-steady pitch maneuvers at Mach numbers of 0.85 and 1.2 with the wing in the 67.5 degree full aft sweep position. The basic objective was to evaluate the usefulness of the FLEXSTAB program for pre-flight airloads analysis of large flexible aircraft. Significant aeroelastic increments were noted between rigid and flexible vehicle results. FLEXSTAB predicted airloads for the outer wing panel were in good agreement with measured data for both rigid airloads and elastic increments. FLEXSTAB results for the horizontal stabilizer were useful for defining general aeroelastic trends, but absolute load levels were not well predicted due to theoretical limitations and difficulties encountered in modelling the complex B-1 configuration. Overall, the FLEXSTAB program is viewed as a useful integrated tool for static aeroelastic analysis in support of flight programs. (Author)

A82-14398 # **Advanced fighter technology integration AFTI/F-16 test program overview.** R. A. Gill and C. L. Saint Sauver (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *AIAA, SETP, SFTE, SAE, ITEA, and IEEE, Flight Testing Conference, 1st, Las Vegas, NV, Nov. 11-13, 1981, AIAA Paper 81-2353.* 17 p.

The AFTI/F-16 Advanced Development Program objective is to develop, integrate, and validate advanced fighter technologies to improve air-to-air and air-to-surface weapon delivery and survivability. The technologies include a Digital Flight Control System, Integrated Flight/Fire Control, pilot/vehicle interface advancements, and advanced flight control modes through direct force control and weapon line pointing. Extensive modifications were made to an F-16A for installation of a data instrumentation system, modified inlet with canards, and a dorsal fairing. The AFTI/F-16 is undergoing an extensive test program to provide the confidence necessary to transition the new technologies for retrofit into existing aircraft or incorporation into new fighter aircraft designs. (Author)

A82-14407 * **Development of a comprehensive analysis for rotorcraft. II - Aircraft model, solution procedure and applications.** W. Johnson (NASA, Ames Research Center; U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). *Vertica,* vol. 5, no. 3, 1981, p. 185-216. 15 refs.

The development of a comprehensive analytical model of rotorcraft aerodynamics and dynamics is described. Particular emphasis is given to describing the reasons behind the choices and decisions involved in constructing the model. The analysis is designed to calculate rotor performance, loads and noise; helicopter vibration and gust response; flight dynamics and handling qualities; and system aeroelastic stability. It is intended for use in the design, testing and evaluation of a wide class of rotors and rotorcraft and to be the basis for further development of rotary wing theories. The general characteristics of the geometric, structural, inertial and aerodynamic models used for the rotorcraft components are described, including the assumptions introduced by the chosen models and the resulting capabilities and limitations. Finally, some examples from recent applications of the analysis are given. (Author)

A82-14414 **The operational characteristics of turbojets, giving particular attention to the cooled high-pressure turbine (Zum Betriebsverhalten von Turboluftstrahlantrieben unter besonderer Berücksichtigung der gekühlten Hochdruckturbine).** W. Muggli (München, Technische Universität, Munich, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 5, Sept.-Oct. 1981, p. 273-283. 6 refs. In German.

The employment of a gas turbine has great advantages for aircraft, provided high operational temperatures and pressures can be used. In connection with the current status of technology concerning materials, it is necessary to cool engine components exposed to the hot gases. The consideration of the cooling processes is an important factor in the determination of the operational characteristics of a turbojet. The computation of the local flow conditions in the blading area of a turbomachine is considered and a description is presented of the computational procedures for determining the amount of heat transferred at a cooled blade of the turbine. The determination of the amount of air needed for cooling is discussed along with the numerical calculation of the operational characteristics of cooled axial turbines. Attention is given to a number of approaches for reducing the amount of air required for cooling in a high-pressure turbine. G.R.

A82-14416 **Wing design for light transport aircraft with improved fuel economy.** D. Welte, R. Birrenbach, and W. Haberland (Dornier GmbH, Friedrichshafen, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 5, Sept.-Oct. 1981, p. 294-303. 5 refs. Research supported by the Bundesministerium für Forschung und Technologie.

Investigations related to the development of a new wing for a light transport aircraft were initiated by a German aerospace company in 1975. Flight tests for the evaluation of the new wing began in June 1979. The considered design incorporates a new wing section and a wing tip having a triangular shape. The induced drag observed in connection with the new wing tip is less than the corresponding value found for wing tips of conventional design. Tradeoff studies were conducted to optimize wing area and wing aspect ratio for the specified performance requirements. A use of the new wing design makes it possible to obtain aircraft with high maximum-lift values, low drag, and good stall characteristics. Attention is given to the wing parameter study, aspects of airfoil design, the flap design, the wing design, the aileron, and the merits of a number of different wing structures. G.R.

A82-14418 **The load-carrying behavior of a trapezoidal aluminum-alloy supporting element, subjected to a compressive stress, in the postbuckling region (Das Tragverhalten eines gedrückten Alu-Trapezträgers im Nachbeulbereich).** E. Schneider (Vereinigte Flugtechnische Werke GmbH, Bremen, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 5, Sept.-Oct. 1981, p. 313-323. 8 refs. In German. Research supported by the Bundesministerium der Verteidigung.

An analysis is conducted of the behavior of a trapezoidal aluminum-alloy supporting element which is subjected to a compressive force, taking into consideration before and after the force reaches the value of the carrying capacity. The analysis makes use of the finite-element method, and takes into account geometrical nonlinearities and the elastic-plastic material characteristics of aluminum. It is found that the behavior of the supporting element in the postbuckling region can be determined with the aid of the slow ramp method, a dynamic computational procedure. The magnitude of the considered system damping and the deformation rate selected for the computation are found to have a significant effect on the result. A comparison of computed and experimental data shows that it is possible to predict the behavior of the supporting element analytically with satisfactory accuracy. G.R.

A82-14676 **NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volumes 1, 2 & 3.** Conference sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1981. Vol. 1, 460 p.; vol. 2, 495 p.; vol. 3, 502 p. Price of three volumes, members, $45.; nonmembers, $60.

Topics of aerospace electronics such as the ADA programming language, inertial systems, microcomputer applications, survivability, and the all-electric aircraft were discussed. Papers were presented on laser gyros and advanced navigation systems, as well as advanced architecture, communications, and radar equipment, software, and avionics and armament planning. Failures in high voltage tubes were considered, and attention was given to signal processing techniques, integrated aircraft controls, fire control, software support tools, cost estimates for software, and medical technology. Emphases were placed on Kalman filter, an electronic terrain map, EM compatibility, aerospace power systems, air traffic control, environmental stress measurements, fault isolation, and multivariable flight control design. M.S.K.

A82-14678 **The design and implementation of a canned scenario function for the F-16 dynamic system simulator.** L. Gearhart (Lear Siegler, Inc., Astronics Div., Dayton, OH) and D. L. Dresel (TRW Defense and Space Systems Group, Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 10-17.

The F-16 Dynamic System Simulator (DSS) is an integrated hardware and software system used to test the F-16 Operational Flight Program (OFP). A major function of DSS is its Canned Scenario, the generation of repeatable scenarios for demonstrations and for the verification and validation of the F-16 OFP. Development of a canned scenario requires the classification of the dynamic characteristics of the system: the inputs, outputs, plant and system states. Analysis of the system being simulated is paralleled by an analysis of the simulation models. The interfaces and models are grouped in blocks according to such characteristics as random or asynchronous versus deterministic behavior. An appropriate set of inputs and initial states is defined for the canned scenario function, based on the user's needs. These initial and input variable sets are incorporated into the software design of the canned scenario, and can be recorded and played back in order to repeat the essential behavior of the system. The scenario is applied to the F-16 OFP as an example, and problems encountered in its implementation are discussed. J.F.

A82-14682 **Strapdown inertial reference systems performance analysis.** G. J. Robinette (USAF, Avionics Laboratory, Wright-Patterson AFB, OH), R. C. Burns, and R. M. Schwarz (McDonnell Aircraft Co., Avionics Engineering Div., St. Louis, MO). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 38-45. 7 refs.

The Strapdown Performance Study (SPS) program is being sponsored by the Air Force Wright Aeronautical Laboratories to determine where improvements in strapdown inertial technology are required to meet the tactical and strategic, navigation and weapon delivery requirements associated with advanced tactical fighters (ATF) and advanced cruise missiles (ACM) of the 1990's. Phase I of this study includes the gathering of data, the development of simulation tools, and the methodology for validation of these tools. Data were gathered on current inertial instruments and systems, fundamental performance limitations, and projected instrument capabilities. Mission profiles for the ATF and ACM are used as the basis for establishing performance goals. Strapdown inertial system implementation data were used to establish a preliminary inertial system error budget consistent with ATF/ACM performance goals. A SIMulated Strapdown Inertial Navigation (SIMSIN) computer program, its development, and seven-step validation process are described. J.F.

A82-14684 **A failure detection and isolation system for tactical aircraft with separated IMUs.** P. Motyka (Charles Stark Draper Laboratory, Inc., Cambridge, MA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 51-60. 7 refs. Contract No. F33615-78-C-1563.

The development and evaluation of a failure-detection and isolation (FDI) system for tactical aircraft with two physically separated inertial measurement units (IMUs) are described. Each IMU consists of four inertial instruments in a symmetrical conical array. The instrument outputs are used for both navigation and flight control, reflecting the underlying multifunction inertial reference assembly concept. FID is performed using the generalized likelihood test, and the thresholds required for FDI are defined. Digital simulation results are presented which show the operation of the FDI system over a spectrum of sensor failures and indicate the effects of these failures on navigation errors. Results show that it may be feasible to detect and isolate only the first three failures of the dual IMU system. Lever-arm compensation results in the faster detection of accelerometer failures at the expense of increased computer throughput. Finally, failures of a magnitude less than the soft-failure-detection threshold are more likely to be isolated incorrectly. J.F.

A82-14685 **A concept for a high-accuracy, low-cost accelerometer.** S. G. Shutt (Rockwell International Corp., Autonetics Div., Anaheim, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 61-69.

A three-axis accelerometer is described in which low cross coupling between axes is achieved by a novel electromagnetic forcing system. A mechanical proof-mass support system is used, which has small bias variation in the presence of large parts instabilities, compared to the usual inertial instruments. This accelerometer concept has the potential for low-cost and high-accuracy operation over a wide temperature range. An experimental accelerometer was designed, built, and tested to determine the feasibility of the accelerometer concept. The main components of this accelerometer are described first: (1) housing and magnet assembly, (2) proof-mass assembly, (3) pickoff assembly, and (4) filament support system. Data were obtained for the spring rates, the bias and scale-factor coupling coefficients, the bias instability, and the bias temperature sensitivity. All measured parameters were within acceptable calculated values; overall operation of the experimental accelerometer was found to be successful. J.F.

A82-14694 **High-accuracy ranging over voice radios for downed aircrew rescue.** R. H. Brader (RCA, Government Communications Systems Div., Camden, NJ). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 128-133.

A high accuracy ranging technique using digital technology and LSI implementation has transformed a conventional military survival walkie-talkie into a position location system that helps rescue downed pilots. This paper first describes the operational requirements and scenario for a military downed-aircrew rescue. The basic technique involved in a half-duplex ranging system and the specific techniques developed to meet the operational requirements and voice radio constraints are then discussed in some detail. The problems discussed are efficient modulations in an AM radio, delay variation control, rapid acquisition using a narrow bandwidth radio, memory requirements for half-duplex operation and digital design for miniaturization. (Author)

A82-14696 **High speed microwave phase-locked loops.** E. M. Perdue (Raytheon Communication Systems Laboratory, Sudbury, MA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 140-145. 9 refs. Research sponsored by the Raytheon Co.; Contracts No. F33615-73-C-4036; No. F33615-78-C-1583.

A microwave synthesizer scheme is developed, which can embody rapid broadband tuning, accuracy and resolution for instituting Doppler correction, spectral purity for low data rate transmission, remote control, and small size for airborne operations. The scheme is directly adaptable to any band of communication, while providing secure antijamming techniques, and the microwave phase-locked loop can control and produce an output with excellent phase noise characteristics, with spurious levels below -60 dBc at any point in the band. The phase-locked synthesizer also meets present switching speed requirements. D.L.G.

A82-14705 Electromechanical actuation development program. S. A. Rowe (AiResearch Manufacturing Company of California, Torrance, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 206-213. 12 refs.

A prototype electromechanical actuation system (EMAS) development program for aircraft flight control systems (FCS) was initiated in February 1976, resulting in a working prototype actuation system suitable for aircraft primary FCS applications. Tests involving EMAS components, performance, environment and control/stability are reported, and program motivation, EMAS description and nomenclature, program history, and future objectives are discussed. D.L.G.

A82-14707 Will power-by-wire replace power-by-hydraulics. I. S. Mehdi (Boeing Military Airplane Co., Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 221-228. 8 refs.

The development of two parallel aircraft actuation and secondary power systems designed within the context of a two-engined fighter is discussed. One is based on engine-extracted hydraulic power while the other is based on engine-extracted electric power. Consideration is given to actuation system requirements, gun and environmental control system requirements, secondary power system requirements, and temperature parameters. Preliminary results are presented for estimates of weights and life cycle costs for each system. Factors important for achieving an all-electric airplane are identified. S.C.S.

A82-14709 The all electric airplane - Its development and logistic support. M. J. Cronin (Lockheed-California Co., Burbank, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 241-247. 19 refs.

Developmental and logistic support aspects that must be considered as a part of the development-cycle of potentially large electric power systems are reviewed. Increasing fuel problems and their impact on the economic viability of commercial airlines are discussed. The hardware design, power generation system, environmental control system, and the engine starting system are also discussed. In addition, the impact of these large electric power systems on ground logistic support and operation from ground power units, auxiliary power units, and fixed-plant installations is considered. D.L.G.

A82-14710 New all-electric-system technology. C. W. Clay (Boeing Commercial Airplane Co., Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 248-254.

The status of electromechanical actuators (EMA) as a key element in the development of an all-electric aircraft system is investigated. It is found that the feasibility of EMA hardware has been amply demonstrated in laboratory systems and an EMA for a research aircraft. Attention is also given to a distributed data bus communication system, a distributed dc power system, questions of overall system integration, and the design of a flight deck. The reported evaluation study shows that hardware for a complete, fly-by-wire, all-electric aircraft system is either available or will approach production readiness within a year or so. A program to integrate this hardware into a comprehensive single system is highly desirable to enhance development as well as optimize cost and weight benefits. G.R.

A82-14711 Weapon delivery system using GPS. A. K. Aggarwal. In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 258-267.

It is pointed out that in a highly dynamic vehicle, such as a fighter aircraft, the GPS User Set is augmented by an Inertial Measurement Unit (IMU) to maintain weapon delivery accuracy during high acceleration maneuvers. This GPS Weapon Delivery System furnishes highly accurate placement of air-to-ground weapons. The system uses a digital computer for computing the automatic release signal in conjunction with an Inertial Measurement Unit and a GPS User Set. The integrated Weapon Delivery System will work together with a Horizontal Situation Indicator, a Vertical Gyro Indicator and/or a Vertical Display Indicator for displaying pilot aiming information. C.R.

A82-14712 Updated station deselection procedures to support automatic Omega receiver operation. R. D. Healy, R. R. Gupta (Analytic Sciences Corp., Reading, MA), and P. B. Morris (U.S. Coast Guard, Washington, DC). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 268-273. 10 refs.

Many automatic Omega receivers use a station selection criterion which does not employ specific propagation-related tests designed to avoid errors caused by wrong-way paths and westerly signal traverse of the magnetic equator. These errors can introduce navigationally significant errors into the Omega position solution, which can, however, be minimized by using the manual station deselection feature of the receiver. This paper describes these potential error sources and presents an updated Omega station selection chart containing specific recommendations for station deselection in a number of worldwide locations. A simple test for detecting wrong-way path propagation is also included. (Author)

A82-14713 Navigation for helicopters by multiple use of inertial sensors. V. Held (Elektronik-System-Gesellschaft mbH, Munich, West Germany). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 274-282.

The paper presents a concept for the inertial functions - flight control, sight-stabilization, navigation - of a helicopter. A minimum number of dislocated inertial sensors is proposed. The systems functions are accomplished on a system level by multiple use of the sensor signals. It will be proven that attitude and heading can be derived from the flight control and stabilization hardware, so that the usually required attitude and heading reference for the navigation is saved. Moreover, the proposed concept provides as an additional function the autonomous initial alignment to north. (Author)

A82-14719 Distributed Time Division Multiple Access /DTDMA/ - A distributed signaling technique for advanced tactical communications. J. Rubin (ITT, ITT Avionics Div., Nutley, NJ). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 332-337. 7 refs. Research supported by ITT.

The Distributed TDMA concept, based on the premise of maximizing the full utility of time, frequency, and code, is described. This multidimensional approach contributes simultaneously to efficient multiple access, antijamming, and low probability of exploitation (LPE) system solutions. The multiple access problem is solved through pseudo-random time and frequency hopping, coupled with interleaved channelization which utilizes low duty signal structures. This random access technique is particularly suited to a Command Control Communication/integrated communication-navigation-identification system as it provides intra-system and related function interference rejections. C.R.

A82-14720 # **Future directions in CNI integrated avionics.** R. L. Harris (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics

Engineers, Inc., 1981, p. 338-344. 21 refs.

In order to appropriately satisfy the expected communications, navigation, and identification (CNI) requirements for tactical aircraft of the 1990's, the estimates of volume, weight, and cost of these functions must somehow be reduced. It is noted that the Air Force and Navy's technology programs for integrated CNI concepts have outlined baselines of current integratable hardware, including the functions of HF, UHF, JTIDS, GPS, SEEK TALK, and IFF interrogator/transponder; the programs have also formulated architectures for future development. Among the developing technologies that affect integrated CNI are very large scale integration (VLSI), very high speed integrated circuits (VHSIC); the future programming language Ada; and the development of charge coupled devices (CCD's), surface acoustic wave (SAW) devices, magnetostatic wave (MSW) devices, and microprocessing. The effects on integration are found to be significant. C.R.

A82-14721 # **A modular multiplexed digital voice intercommunications system.** R. F. Bolt and J. J. Seal (U.S. Navy, Naval Avionics Center, Indianapolis, IN). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 345-349. 7 refs.

The design and development of a modular multiplexed digital voice Intercommunications System (ICS) for military applications is described. This system, under development at the Naval Avionics Center, uses a dedicated MIL-STD-1553B multiplexed data bus; its modular design consists of Weapon Replaceable Assemblies (WRAs). The system architecture will provide integrated radio control using a single data bus that carries both digital voice data and control information. This ICS can be configured for a particular aircraft by arranging the various subsystem WRAs to satisfy the weapon system requirements. This paper discusses the functional requirements of the WRAs in the digital voice ICS. System concepts have been demonstrated in the three-station Multiplexed Digital Voice ICS. This breadboard system provides ten bit-rate/audio bandwidth combinations which have been evaluated for intelligibility in three aircraft acoustic noise environments. The intelligibility test results and the results of a package configuration study are summarized. (Author)

A82-14723 **Detection range analysis of an airborne medium PRF radar.** M. B. Ringel (Westinghouse Electric Corp., Baltimore, MD). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 358-362. 10 refs.

The detection range of an air-to-air medium PRF radar is analyzed in terms of the signal processing involved in multiple PRF ranging, the nature of the ground clutter in the range Doppler space defined by such a radar, and the radar/target kinematics. References containing prerequisite knowledge and similar analysis for other types of radars are cited, and the analysis in this paper is compared to previous works. A flow chart of a computer program implementing the analysis outlined in this paper is presented. (Author)

A82-14725 **Using phased array radar for data communications.** H. D. Lewis (RCA, Government Systems Div., Moorestown, NJ). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 371-376.

The idea of using a multifunction array radar at the controlling master station for the additional function of data transmission and reception is introduced. Here, cooperating stations, equipped with suitable transponders, are beacon tracked by the radar, providing positive identification of each station as well as highly accurate positional data for the cooperating stations. Among the applications of this system are surface-to-air command and control, long-range targeting and track from air-to-surface, and surface-to-surface coordination, including both monostatic and multistatic operations. It is pointed out that the high power aperture product and low antenna sidelobes of the phased array radar are inherent characteristics that can be used in combatting ECM. What is more, the ability of multifunction phased array radar to revisit the cooperating station as often as required permits a reliable interchange of data on an interrogation/rely basis. C.R.

A82-14735 **Computational considerations for fusion in target identification systems.** E. L. Waltz (Bendix Corp., Communications Div., Ann Arbor, MI). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 492-497. 29 refs.

This paper presents an overview of the computational implications of applying multisensor data to the target identification problem. Recent efforts to develop a mathematical basis for multisensor correlation (fusion) have been performed by the services and have been directed at local (autonomous) and regional (netted) systems for a wide range of applications. These studies have developed algorithms for ASW, air-air identification, battlefield management, ocean surveillance and air defense. An overview of these 'fusion algorithms' and their relationship to classical pattern recognition is presented. The hierarchical aspects of correlation, combination and aggregation are described and their effects on system complexity are discussed. Key parameters, which characterize the general fusion system, are described and related to processing requirements. These computational requirements are compared to expected VHSIC/VLSI capabilities to project the potential for integrated fusion processing in advanced avionics and weapons systems. (Author)

A82-14739 **Evaluating sources of error in EAR/GEANS navigation using a Kalman postprocessor.** S. H. Musick (USAF, Avionics Laboratory, Wright-Patterson AFB, OH) and N. A. Carlson (Intermetrics, Inc., Cambridge, MA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 520-526. 9 refs.

EAR/GEANS is an integrated radar/inertial system consisting of a coherent multimode radar, EAR, and an accurate inertial navigation unit, GEANS. The EAR radar makes velocity and position measurements that aid GEANS while GEANS in turn supplies EAR with navigation data for measurement control and motion compensation. In this complex system many error sources affect navigation performance. This paper describes an effort to evaluate flight test navigation performance in terms of fundamental sensor error sources. The various models and tools that were developed are discussed. The key tool is a high-order Kalman filter, called the Error Isolation Filter, used as a postprocessor of flight-recorded data. Simulated flight test results are presented to demonstrate error recovery performance. Performance of the EIF using actual flight data is discussed. The paper emphasizes the experiential aspects of the effort. (Author)

A82-14740 **The use of observers on relaxed static stability aircraft.** R. H. Rooney and E. Y. Shapiro (Lockheed-California Co., Burbank, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 527-533.

An observer is a dynamical system that reconstructs the states of a system that is used to drive it. Observers can be used when a normally available signal is unavailable due to sensor failure, or as a sensor replacement when the use of a sensor may be undesirable due to operational considerations. The signal provided by the observer can then be used as an input to a controller for various purposes such as stabilization, optimization, or decoupling. The fundamentals of observer design are reviewed and simulation results of observers implemented on Relaxed Static Stability (RSS) aircraft are presented. It is shown that while performance of observers in a RSS aircraft setting is degraded somewhat, their use in unstable applications is not precluded. (Author)

A82-14741 **Integrated Flight/Weapon Control design and evaluation.** W. J. Murphy (McDonnell Aircraft Co., St. Louis, MO) and W. L. Young, Jr. (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the

National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 536-543. Contract No. F33615-79-C-3604.

The Integrated Flight/Weapon Control (IFWC) program is aimed at developing integrated flight/fire control technology. This includes increasing weapon delivery capabilities, survivability, and operability in the delivery of guided weapons and dispenser munitions. The completed development of selected concepts through preliminary design is presented; pilot-in-the-loop simulation was used for concept refinement and validation. The preliminary results, based on pilot evaluation, showed that the tactical munitions dispenser weapon delivery system is accurate and provides increased survivability over conventional delivery. The air-to-surface missile delivery system was also found to be good, especially in clear daylight conditions. The most favorably received feature of the IFWC air-to-air weapon delivery system was IFFC-I/FIREFLY III gunnery, which had increased all-aspect gun opportunities in precision pointing, near head-on, long-range opportunities, and high angle-off opportunities. J.F.

A82-14742 **Software considerations in the design of computer generated flight displays.** M. Miller (HRB Singer, Inc., State College, PA) and A. J. Aretz (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 544-548.

The use of formats which take advantage of color imagery and the capabilities of a digital computer is one way of presenting information to pilots that is clearly understandable and requires little interpretation. The functional requirements of four specific graphic presentations and their impact on the design of the display generation software are discussed. The four formats considered are (1) the tactical situation format, (2) the stores status format, (3) the head-up display format, and (4) the integrated flight path format. Due to the dynamic nature of the aircraft, the formats are also required to be dynamic, with a minimum update rate of 5 Hz. Attempts to simulate flight and generate the integrated flight path format have achieved an update rate of 2 Hz. Generating color pictures with computer graphics is essentially a paint-by-number exercise, where color assignment is determined from a VLT. J.F.

A82-14743 # **The influence of smart computers on the cockpit of the future.** N. L. Gravely and J. O. Mysing (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 549-556. 7 refs.

Recent developments in digital technology at the Air Force Wright Aeronautical Laboratories are presented, which will have great impact on the cockpit of the future. Characteristics of the Digital Avionics Information System, representative of the state-of-the-art in cockpit technology, are first discussed. Future capabilities to be achieved by artificial intelligence are then outlined: flexible cockpit reconfiguration, crew decisions aided by computerized systems consultant, machines that understand and converse in free text, and computer vision that can interpret sensor images. A very high speed integrated circuitry (VHSIC) is being developed, which would extend and refine the metal-oxide-semiconductor and bipolar technology to increase through-put rates and improve reliability, while decreasing size and power consumption. Compared to the present F-16 computer, the VHSIC would provide a 90% reduction in size, volume, and weight, an 85% decrease in power, and a 100% increase in MTBF. An intelligent software program (modification of MYCIN /Bernhard, 1980/) is being considered, which would aid the pilot during in-flight system failures. Subsystem developments in the areas of graphics and computer generated imagery, dynamic pictorial displays, image processing, and aircraft emergency procedures are also discussed. J.F.

A82-14744 **A methodology for missile launch envelope display evaluation.** G. E. Corrick (Hughes Aircraft Co., Culver City, CA) and P. V. Kulwicki (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 557-564. Contract No. F33615-79-C-0508.

A methodology for objective evaluation of advanced display formats is described. A computer generated, manned, non-interactive single-target air combat simulation was used to evaluate two advanced VSD (vertical situation display) and HUD formats with respect to current F-15 air combat displays. The principal performance measures obtained were pilot responses to questions about the simulated engagement and a measure of the cognitive workload imposed by the format, assessed by the Sternberg reserve capacity task. The pilots comments and opinions were also obtained in a post-evaluation debriefing. Nine operational Air Force pilots were subjects. Results showed no large differences in performance on mission questions across formats, but large differences in imposed cognitive workload. All HUD formats imposed more workload than VSD formats and there was a strong correlation between the objective results and subjective opinions. (Author)

A82-14745 # **Assessing pilot workload - Without disturbing pilot behavior.** R. J. Elder (USAF, Warner Robins Air Logistics Center, Robins AFB, GA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 565-571.

The need for the design of practical pilot workload assessment techniques which do not obstruct the normal operational procedures of the pilot subjects is discussed. An analysis of the pilot tasks in an air-to-air engagement is presented. Workload assessment techniques are analyzed for their applicability to the single-seat fighter environment. The procedure for design of an experiment using these techniques is demonstrated for an F-15 air-to-air engagement. Applications of the method in weapon system modification and operational training evaluation are discussed. (Author)

A82-14750 **Evaluation of advanced air-to-air gunnery fire control systems.** N. M. Shah and J. Stalony-Dobrzanski (Northrop Corp., Aircraft Div., Hawthorne, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 615-622.

Three advanced fire control systems, based on the director-type radar fire control system, were designed for an advanced fighter aircraft. These systems are: fixed gun, trainable gun, and integrated fire flight control (IFFC). In addition, an automatic range control (ARC) system, which uses radar information for maintaining range with respect to target, was designed. The air combat performance with each system was evaluated on the simulator with realistic radar noise and hardware constraints. The ARC was evaluated with fixed gun only. The results show definite superiority of the trainable gun, even with relatively modest gun travel and servo power, over a fixed gun and IFFC. The trainable gun, IFFC, and ARC concepts provide improved tracking performance, with considerable reduction in pilot workload, over the fixed gun. The time to achieve first hit is shortest with the trainable gun. The ARC enhances survivability by minimizing overshoots with respect to the target. (Author)

A82-14759 # **Assessment methodology of the lightning threat to advanced aircraft.** R. A. Perala (Electromagnetic Applications, Inc., Denver, CO) and G. A. DuBro (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 691-697. 19 refs.

An overview of an assessment methodology concerning the lightning susceptibility of aircraft is presented. Work in this area is concentrated on increasing the general understanding of the physics of the aircraft-lightning interaction and on developing specific laboratory threat simulation testing techniques. Recent advances in both testing/simulation and analytics are discussed. These advances have been made possible by the incorporation of nuclear electromagnetic pulse technology and recent indications from measurements of natural lightning which suggest that significantly greater electromagnetic energy exists in the frequency range where increased coupling of such energy to the aircraft is possible. B.J.

A82-14760 **The Navy F/A-18A Hornet electromagnetic compatibility program.** J. R. Ketterer (McDonnell Aircraft Co., St. Louis, MO) and J. J. Fisher (U.S. Naval Air Systems Command, Washington, DC). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 698-702.

The F/A-18A Hornet is a first line carrier-deployed aircraft employing advanced composite structures and state-of-the-art digital electronics. Because the electromagnetic environment (EME) generated on present day carrier decks can reach field strengths over 10,000 Volts/meter at some frequencies, electromagnetic compatibility (EMC) challenges were presented. The approach to aircraft EMC design established for the F/A-18A required using the airframe as an enclosed electromagnetic (EM) shield. This shielding concept allowed equipment located within the airframe shield to be designed to a less severe EM environment than equipment located outside the airframe shield. Using the airframe as an electromagnetic shield presented a significant challenge, particularly because graphite/epoxy composites represent more than one-third of the F/A-18A surface area. Overall, this concept was found to represent the least cost, weight, and design impact both to the airframe and to the electrical or electronics equipments. (Author)

A82-14761 **A recursive time domain analysis of distributed line grid networks with application to the LTA/EMP problem.** W. S. McCormick (Wright State University, Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 703-708.

Modeling the aircraft fuselage as a two-node, TEM, lossy distributed network, a recursive time domain technique is presented to estimate the fuselage skin-current induced by a remote lightning strike. The technique involves the determination of the two discrete nodal transfer functions followed by an application of Duhamel's theorem to the distributed electromagnetic excitation case. The Fourier transform of the induced fuselage skin-current is presented as a function of the azimuth and elevation angles of the incident, plane electromagnetic lightning excitation. Reference to the PORTER and NOAA flight programs is made along with a discussion of future application areas. (Author)

A82-14762 **New advances in signal processing technology for integrated CNI avionics.** C. R. Ward and R. A. Reilly (ITT, ITT Avionics Div., Nutley, NJ). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 712-722. 20 refs.

Functionally integrated CNI (communication, navigation, and identification) radio systems appear to be attractive as a means of resolving size and weight conflicts between conventionally designed radio systems on space-limited tactical military aircraft. In practice, integration is often frustrated by basic incompatibilities between widely divergent signal structures. Although there are many very complicated aspects to the problem of functional integration, this paper addresses only the problem of accommodating the reception of different signal structures efficiently and flexibly in the RF to baseband domain. A radically different approach to radio receiver design is proposed, which employs high speed digital and/or CCD technology which could be ready for field deployment by the 1990 time frame. Several alternative system level architectures are proposed and the tradeoffs between them evaluated. (Author)

A82-14763 **Advanced integrated CNI architectures.** P. C. Camana, S. K. Ogi, and L. R. Stine (TRW Defense and Space Systems Group, Redondo Beach, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 723-728.

Integrated terminal architectures can produce a modern CNI (communications, navigation, and identification) system at an affordable life-cycle cost within real estate requirements. Major considerations include use of common modules, RF and digital large scale integration (LSI) technology insertion, and high performance programmable digital signal processing. The RF subsystem consists of conventional RF and IF chains of common modules combined with the RF-LSI technology. The digital processing subsystem is an array of programmable signal/data processors with the core element being a VLSI 100 MIPS single card signal processor. Common modules, network reconfigurability, and high level of integration will provide for lower life-cycle costs with reduced systems size, weight, and power dissipation. (Author)

A82-14765 **The agile transversal filter - A flexible building block for ICNIA.** D. G. Botha (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH) and F. W. Smead (ITT, ITT Avionics Div., Nutley, NJ). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 735-740. USAF-sponsored research.

Integrated Communications, Navigation and Identification Avionics (ICNIA) is an advanced development program to demonstrate an integrated systems approach to the implementation of functions normally performed by a collection of independent black boxes. The system design partitions all CNI functions to optimize modular commonality within the ICNIA system. One function required in many parallel channels is the processing of signals with instantaneous bandwidths of 10 MHz or less. A specific implementation is the Narrow Band Agile Transversal Filter (NBATF), which can be implemented in state-of-the-art technology, can process signals with a variety of algorithms selectable under software control, and can be replicated within the system, as required, to perform the total set of functions. The NBATF constitutes a building block module within the ICNIA system. (Author)

A82-14767 **Applications of covariance analysis simulation to avionics flight testing.** A. Foote, C. Vellenga, J. Price, and W. Buchholz (Logicon, Inc., Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 750-756.

The application of covariance analysis simulation techniques to the conduct of developmental flight test of integrated navigation systems is presented. In particular, this paper describes how covariance analysis simulation techniques are being used in the planning, execution, and analysis phases of the B-52 Offensive Avionics System (OAS) flight test and discusses how they may be applied to future testing. The mission flexibility of modern strategic aircraft and the built-in redundant modes of operation define a large number of scenarios which must be tested. The role of covariance analysis simulation techniques in the B-52 OAS flight test is to assist in the planning and execution phases and to provide information supplemental to actual flight-test results. Discussions of the use of covariance analysis simulation techniques in each of these test phases are presented together with a sample of results from a B-52 OAS flight test. (Author)

A82-14768 **Application of multiple model estimation techniques to a recursive terrain height correlation system.** W. Tang and G. L. Mealy (Analytic Sciences Corp., Reading, MA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 757-764. Grant No. DAAK80-79-C-0268.

This paper describes the results of a study which determined the performance capabilities of a recursive terrain correlation system proposed for low altitude helicopter navigation. A Monte Carlo simulation program was developed to assess the effectiveness of the terrain correlation algorithm. The sensitivity of the system to various error sources was evaluated and filter modifications to enhance system performance were proposed. An alternate configuration, based upon multiple model estimation techniques, was shown to afford a substantial decrease in system sensitivity to initial position uncertainty. (Author)

A82-14769 # **Algorithms for an adaptive dynamic window in electronic map systems.** D. L. Sander (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 766-768.

Algorithms have been developed for an adaptive dynamic window which closely conforms to irregular shaped areas. These algorithms advance the window as the aircraft moves, adapt it to new geometries as they evolve, and provide for buffer zones in advance of expected movement and maneuvers. This paper describes these algorithms following a brief discussion of past and present dynamic window techniques used by the Air Force Wright Aeronautical Laboratories Avionics Laboratory. (Author)

A82-14770 **Airborne Electronic Map Systems. I - Design.** R. Hoffman and G. Burnham (Texas Instruments, Inc., Dallas, TX). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 769-772.

The requirements and implementation of an Airborne Electronic Terrain Mapping System (AETMS) are discussed. Display formats with plan views, flat images, and perspective views, all comparable to window or boresight images or viewpoints other than the pilot's, simulation of aircraft motion at speeds up to Mach one, and cost effectiveness, i.e. minimum cost, and interface capabilities are mentioned as necessary aspects for simulation or in-flight use. The data flow comprises a series of refinements of raw terrain data and time dependent user parameters, and the limiting factor of storing only pertinent regional data for airborne use due to technological weight restrictions for stored memory is stressed. Processing and regional memory selection are examined, including the use of up to 13 multipliers and 60 adders to perform up to 80 million operations/sec for a full range of CRT image generation. M.S.K.

A82-14771 **Airborne Electronic Terrain Map System.** J. W. Weber and E. W. Opittek (Hughes Aircraft Co., El Segundo, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 773-778.

The paper reports on the Airborne Electronic Terrain Map System Program, which has resulted in the development of a flyable brassboard for the evaluation of display applications for the Defense Mapping Agency digital data base. A summary of the display formats and supporting simulations such as the plan view contour and perspective views is given, and a system description is presented, which reviews features such as the regional memory, display generator, software, and support equipment. D.L.G.

A82-14772 **Passive terrain following using stored map and global positioning system.** A. C. Woodward and W. M. Hoover (Texas Instruments, Inc., Lewisville, TX). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 779-785.

The configuration and preliminary results are presented for a flight test program conducted to illustrate the potential for passive terrain-following (TF) flight by combining current map storage, the NAVSTAR Global Positioning System (GPS) and TF algorithm technologies. Primary aspects of the GPS/MAP TF system and flight test program include terrain profile descriptions, GPS position and aircraft state information, and TF command computation. Results indicate that position/map techniques can be used in low-level flight control, and eventually operational systems should control primarily from position and map information. D.L.G.

A82-14773 **Airborne Electronic Terrain Map System. II - Applications.** G. Burnham and C. S. Kline (Texas Instruments, Inc., Dallas, TX). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 786-789.

Applications of the Airborne Electronic Terrain Map System are considered. These include: (1) the provision of covert, all-weather weapon delivery for combat aircraft; (2) the use of stored terrain data to substitute for data normally provided by a forward-looking sensor; (3) the use of stored terrain data to generate a display that the pilot can use to fly low and avoid terrain higher than aircraft altitude; and (4) the extension of the system to sensor blending concepts with radar and FLIRs. S.C.S.

A82-14774 **Technical/operational ATC scenarios for future TMA navigation.** K. D. Kricke and L. Knapp (Elektronik-System-Gesellschaft mbH, Munich, West Germany). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 792-799. 8 refs.

Air traffic control is discussed in terms of the entire air traffic system, and as a national authority. The terminal maneuvering area (TMA) is considered with reference to typical configurations, approach and departure phases, and such areas for improvement as possibilities for increased capacity, environmental protection, and fuel-saving flight profiles. A number of possible advances in TMA scenarios are identified, including three- and four-dimensional navigation, secondary radar systems and data-processing systems for automated air traffic control. S.C.S.

A82-14775 **Some Italian research for developing new primary ATC radars.** M. Calamia (Firenze, Università, Florence, Italy). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 800-807. 15 refs.

A survey of Italian research on primary air traffic control radar systems is presented. Types of clutter affecting such systems are discussed, and the parameters defining the filter capacity of radar with respect to clutter are identified as the improvement factor and subclutter visibility. Studies conducted to characterize dynamic clutter phenomena at airports in Rome and Naples in 1979-1980 are reported. Attention is given to adaptive moving target indicator filtering techniques. A method for the recording and analysis of atmospheric clutter echoes using an orthogonally polarized double-channel receiver is considered. S.C.S.

A82-14776 **Performance evaluation of target report extractor in the monopulse ATCRBS.** D. Giuli, M. Fossi (Firenze, Università, Florence, Italy), and E. Dalle Mese (Pisa, Università, Pisa, Italy). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 808-815. 11 refs. Research sponsored by the Consiglio Nazionale delle Ricerche.

In this paper some results are reported, obtained via an analytical approach, which are relevant to the performance evaluation of an Air Traffic Control Radar Beacon System (ATCRBS) monopulse extractor to be devised in a Discrete Address Beacon System (DABS) for Air Traffic Control (ATC). Suitable statistical models of the correlation tests used by the dwell-time section of the receiver are developed. The obtained results refer to a statistical analysis of the dwell-time section which performs the defruiting function. (Author)

A82-14777 **A multimicroprocessor system for ATCRBS monopulse data processing.** E. Borgheresi, D. Giuli, F. Pirri (Firenze, Università, Florence, Italy), G. Oppimiti, and C. Poli (Marina Italiana Istituto G. Vallauri, Leghorn, Italy). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 816-822. Consiglio Nazionale delle Richerche No. 80,00385,91.

In this paper the problem of the dwell time processing of aircraft replies in the Air Traffic Control Radar Beacon System (ATCRBS) section of the Discrete Address Beacon System (DABS) is considered. A solution is suggested which is based on the use of a multimicroprocessor system. A brief description of the hardware structure of the system is given and the algorithms used for processing the replies are shown. Such algorithms aim at improving the efficiency of correlation procedures among reply reports received by the same target during the antenna dwell time. Parallel processing is obtained through a 'sliced-azimuth' subdivision of the amount of the total job. (Author)

A82-14778 Flight management systems for modern jet aircraft. R. H. Farmer (General Motors Corp., Delco Electronics Div., Goleta, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 823-829. Contract No. F09603-79-C-1610.

Attention is given to flight management computer systems for modern jet aircraft, noting tests run on Air Force C-141 aircraft. Fuel-saving aircraft operations are identified, including optimum takeoff and climb schedules, cruise Mach control, optimized altitude selection, delayed flaps, ATC flow control, and area navigation/direct routing. Data from the C-141 Fuel Savings Advisory System are reported. In this system, the flight management system provides vertical navigation, speed control, flight planning control, and horizontal flight path commands to the inertial navigation systems. The data show that significant fuel savings are possible by close attention to many small efficiencies of flight operations. S.C.S.

A82-14779 Weather impact on low-altitude imaging infrared sensors in Europe - An availability model. E. R. Edge (Analytic Sciences Corp., Reading, MA), J. D. Malick, and J. H. Allen (SRI International, Menlo Park, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 832-839. 5 refs.

This paper discusses the development of a methodology for evaluating the availability of low-altitude electro-optical (EO) sensors for imaging of ground targets. Because of the wide range of possible target types and their possible geographical distribution, a flexible tool for the assessment of current and future sensor designs is presented. This analysis tool, which is available as a FORTRAN computer program named WEATHER, includes a statistical model of all weather effects, accounts for seasonal, diurnal and geographical variabilities, allows for arbitrary distributions of targets, and provides estimates of simultaneous outages over wide geographical areas. (Author)

A82-14780 Study of the effects of maneuver compensation on beam pointing accuracy. D. E. Miracle (Logicon, Inc., Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 840-846. Contract No. F33657-78-C-0490.

It is commonly necessary to aim an airborne antenna consistently at a target antenna. This aiming is simple enough when angle measuring resources are devoted to the target, but these resources are available only a small fraction of the time. Consequently, with no compensation during maneuvers and between measurements, the antenna may be aimed significantly off target. Consideration of this problem for present medium performance aircraft having state-of-the-art navigational and EW systems indicates that several simplifying mathematical approximations are justifiable. These lead to a set of compensation algorithms which are operationally and computationally superior to known alternative methods. The method involves performance angle measurements at a slower rate than is normally required, relying upon a set of intermediate pointing corrections for coverage maintenance. The forms of the algorithms are simple enough to permit implementation on the EW computer, or if necessary, other hardware. (Author)

A82-14788 Conceptual design of an integrated power and avionics information system. G. L. Dunn and P. Leong (Boeing Military Airplane Co., Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 954-962. 5 refs. Contract No. F33615-80-C-2004.

A nonintegrated DAIS type architecture has been used as a baseline to determine power system control requirements for a two-engine tactical aircraft and to assess the relative merits of the hierarchical and integrated architectures. Two power generation and distribution configurations using solid state power controllers, three power control system concepts, and two integrated power and avionics architectures were considered. It is found that the integrated architectures with smart ELMCs (electrical load management centers) represents the best utilization of the data bus and has acceptable processor loading. The processor overhead is the least and both logical equation processing and bus loading make optimum use of the available DAIS technology capabilities for a single data bus. P.T.H.

A82-14789 60 kVA ADP permanent magnet VSCF starter generator system - A program overview. R. C. Webb (General Electric Co., Binghamton, NY). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 963-965. Contracts No. F33615-78-C-2200; No. F33615-74-C-2037.

The paper reviews an Air Force-sponsored program to design, construct, demonstrate flight worthiness, and flight test 60 kVA variable speed constant frequency (VSCF) permanent magnet (PM) electrical starter/generator systems using high energy product samarium cobalt magnets in an all metallic solid rotor. PM VSCF system offers a significant improvement in electrical generating system efficiency over presently used systems. The PM VSCF also offers a simplification of the engine auxiliary gearbox area and aircraft ducting by combining the engine starting and electrical power generation functions into one system. P.T.H.

A82-14791 High speed PMG containment study for VSCF system. M. M. Youn (General Electric Co., Erie, PA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 971-977. 6 refs. Contract No. F33615-80-C-2032.

A permanent magnet rotor containment method chosen for variable speed constant frequency (VSCF) applications is described. The containment method employs amortisseur bars in the magnetic member of the bimetallic shrink ring to reduce the commutating reactance of the generator for stable converter operation. The significantly higher energy product combined with high temperature capability of the magnet provides the basis for permanent magnet machines which are smaller, higher in efficiency, and more reliable than wound rotor machines. P.T.H.

A82-14792 Failure analysis of variable reluctance stepper motor. D. L. Hart and J. A. Ziegenhagen (Dayton, University, Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 978-982.

The variable reluctance stepper motor is an integral part of the electronic fuel control system on a jet engine in that it regulates the fuel flow to the engine. The stepper motor is required to operate in a high temperature environment while immersed in a jet fuel. This paper reviews the failure modes, analysis techniques, and the recommended corrective actions. (Author)

A82-14793 The payoff from U.S. investment in aeronautical research and development. R. C. Lenz (Dayton, University, Dayton, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 984-991. NSF Grant No. SRS-79-10397.

This paper presents a quantitative analysis of the returns on U.S. investments in aeronautical research and development over the fifty years from 1926 to 1976. The returns on the investment are those obtained through productivity improvements in the airline industry, independently of any other returns. The net gains from the R&D expenditures are very large in comparison with standard commercial opportunities during the same period. However, neither the aircraft builders who performed most of the R&D, nor the airlines who bought and used the aircraft, received the largest part of the gain. Instead, the gains were distributed primarily to the traveling public, and to a lesser extent to airline employees. A key point of the research is the construction of probable aeronautical R&D expenditures for the years before 1957, the first year for which National Science Foundation statistics are available. Another feature is the use of seat-mile data as the appropriate measure for airline output in the productivity calculations. An innovative concept, the use of hypothetical 'phantom fleets' to determine productivity gains, is introduced. (Author)

A82-14794 Parallel processing applied to digital flight control systems - Some perspectives. T. F. Westermeier (McDonnell Aircraft Co., St. Louis, MO). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1010-1017.

Parallel processing techniques are thought to have the potential for increasing the performance of digital flight control systems. A number of issues are addressed to determine if the potential can be realized. The composition of generic flight control software is examined to determine its amenability to parallel solution. From this examination, two prototype software decompositions and their resulting architectures are proposed and evaluated in terms of iteration rate, transport lag, and computation time. The impact of parallel processing on size, weight, power, and reliability is examined next. Finally, the throughputs of microprocessors are evaluated to determine their suitability as processing elements. (Author)

A82-14796 Microprocessor flight control application study. F. C. Neebe, S. J. Hissong (General Electric Co., Binghamton, NY), and W. E. Nelson, Jr. (Northrop Corp., Aircraft Div., Hawthorne, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1022-1029.

Digital flight control computers are now being used to implement control functions on high performance military aircraft. Microprocessor technology has advanced to the point where it is possible to implement many simple control functions. Several microprocessor subsystems working in parallel can be used to set up systems which have extensive control capability. This paper describes the results obtained from setting up a small microprocessor system to perform pitch control for a modern lightweight fighter aircraft. Information is presented detailing system configuration and response. (Author)

A82-14814 Implementing the DAIS executive. S. W. Behnen (Boeing Military Airplane Co., Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1149-1154. 8 refs.

The Boeing Military Airplane Company has been studying the feasibility of applying the DAIS executive to a production aircraft system. The advantages and disadvantages of implementing a member of the DAIS executive family have been investigated for several existing and projected aircraft systems: new and upgraded avionics systems; flight control systems; and an electrical power distribution and control system. Although certain operational requirements for these systems will entail enhancements in the current executive design, the basic philosophy and structure of the DAIS executive make it desirable in each of these systems. As a result of its favorable review of the DAIS executive, BMAC is proposing to use DAIS executive variants on new systems such as an electrical power and distribution system and an avionics system. The decision to implement a DAIS executive in an upgraded version of an existing system will depend on the result of cost/benefit trades. (Author)

A82-14817 A storage device for subsystem maintenance information. C. J. Tavora and H. M. Collins (Houston, University, Houston, TX). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1170-1174. Contract No. F33615-80-C-1095.

This paper describes the Electronic Nameplate (ENP) - an electronic storage device which may be attached physically to avionic subsystems to store information relevant to their identification, interface specifications, calibration procedures, fault-isolation tests and operational performance. The ENP can be integrated into a single chip device with a standard connector through which it receives power and communicates. Prototypes of the ENP have been implemented and tested for the Air Force Wright Aeronautical Laboratories. (Author)

A82-14819 Computer modeling of an aircraft HVDC electrical system. J. D. Segrest (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA) and D. L. Sommer (Boeing Military Airplane Co., Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1192-1199. 11 refs. Contract No. N62269-79-V-0265.

This paper describes the development of mathematical models, which represent typical 270 VDC aircraft electrical systems, and the analysis of these models on the EASY Model Generation and Analysis Program. The mathematical models of the following components of a high voltage dc (HVDC) electrical system were developed: (1) buck multiple loop switching regulator with EMI input filter; (2) dc solid rotor generation system; (3) dc wound rotor generation system; (4) flat conductor distribution bus; and (5) aircraft load. The EASY program is then used to analyze a system by specifying the topology of a network of these predefined components. Sample simulation results are included. (Author)

A82-14820 Digital simulation of aircraft electrical generating system by means of Sceptre program. D. Fair, J. Dhyanchand, E. Parker, and H. Bahanassy (Sundstrand Advanced Technology Corp., Rockford, IL). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1200-1205. 5 refs.

A computer program is presented which simulates the aircraft electrical generating system. In this computation analysis, a constant speed drive with electronic governor, brushless aircraft ac generator, and voltage regulator are simulated as a system. These subsystems were linked for a complete aircraft electrical power generating system by means of the Super-Sceptre program and FORTRAN subroutines. The 60 KVA Sundstrand Aircraft Generating System was simulated with this model for on-off transient loads. The simulated results were found to be in close agreement with experimental data. (Author)

A82-14821 Computer simulation of an advanced aircraft electrical system. A. J. Marek, D. F. Sellers (Vought Corp., Dallas, TX), and D. Fox (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1206-1215.

Computer simulation programs which were developed for advanced aircraft electrical system designs are described. The programs consist of four separate modules encompassing the IDG generating system, VSCF generating system, parallel generator operation, and the power distribution system. Each program is written in FORTRAN V and is based on data supplied by power generating system manufacturers and data derived from various texts. This paper describes the procedure for program development; program features, structures, parameters, and accuracy; and program solution run times. The capabilities of the developed programs are discussed, and a representative sample of simulation runs with computer plots are presented. P.T.H.

A82-14823 # Airborne color CRT displays. H. L. Waruszewski, Jr. (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21,

1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1224-1243. 15 refs.

It is suggested that new human factors data and cockpit requirements need to be developed and applied to color cockpit displays so that requirements for a usable display can be generated. The color display technology needs to be evaluated with regard to satisfying the established human factors requirements. Test methodologies need to be developed to determine the compliance of the color displays with the specification requirements. In addition, color displays need to be integrated into the cockpit using total cockpit human factors criteria to maximize the possible workload reduction and safety of the aircraft. Such color display technologies as beam penetration color CRT and shadow mask color CRT are described, and applications of color CRTs (including tactical and map displays, and flight control and engine displays) are considered. P.T.H.

A82-14824 **The Maneuvering Flight Path Display - A flight trajectory solution display concept.** J. F. Watler, Jr. and W. B. Logan (Northrop Corp., Aircraft Div., Hawthorne, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1254-1260. 5 refs.

The Maneuvering Flight Path Display (MFPD) provides to the pilot an anticipatory, real-time presentation of the command flight path. The presentation depicts the 'solution' of the desired trajectory, thus telling the pilot 'what to do' and 'how to do it'. This information is displayed graphically, eliminating the need for the traditional dials, scales, pointers, or alpha-numeric readouts. The pilot, by controlling the aircraft to fly just above the graphical flight path being portrayed, is assured of precise 4-D trajectory control. It is concluded that the success of the MFPD development and the consequent rapid maturation of the concept has stimulated a widespread interest in advancing the program to flight demonstration as quickly as possible. P.T.H.

A82-14825 # **The LANTIRN wide field-of-view raster Head-Up Display.** R. L. Berry and J. C. Byrd (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1261-1268.

As part of the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) System, a new Head-up Display (HUD) is being developed as replacement for the existing HUDs in the F-16 and A-10 aircraft. The primary improvements will be greatly increased field-of-view and the capability to display Forward Looking Infrared (FLIR) video. The HUD will use diffraction optics in the combiner as the main tool by which improvements in field-of-view, contrast ratio, and see-through visibility are achieved. This paper is an overview of the use of diffraction optics in the LANTIRN HUD. (Author)

A82-14826 **Enhanced aircraft handling qualities by longitudinal dynamics mode decoupling.** H. Y. Kim, R. H. Rooney, and E. Y. Shapiro (Lockheed-California Co., Burbank, CA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1270-1275.

The present paper investigates decoupling procedures using output feedback on longitudinal axis dynamics of a wide body transport aircraft. The possibility of decoupling through output feedback is rather restrictive compared to the possibility of full state feedback. Therefore, when output feedback decoupling is not possible, the state variables are reconstructed by the Luenberger observer to be used in full state feedback decoupling of the system. The results of this approach are presented via simulation. (Author)

A82-14827 **A synthesis technique for highly uncertain and interacting multivariable flight control systems.** I. Horowitz, O. Yaniv, B. Golubev, and L. Neumann (Weizmann Institute of Science, Rehovot, Israel). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1276-1283. 7 refs. Grant No. AF-AFOSR-80-0213.

A recent synthesis technique has the attractive property that the uncertain multiple input-output (MIO) feedback problem, is converted into a number of uncertain single-loop problems. Under certain general conditions, the solutions of the single-loop problems are guaranteed to be satisfactory for the MIO problem. This technique is applied to the Ay-direct side force mode of a fighter CCV aircraft. The objective is to achieve fast Ay response with small sideslip and roll, over a range of flight conditions. Three designs of varying complexity are presented with simulation results. The technique clearly reveals the conflicting design factors and trade-offs. (Author)

A82-14828 # **Direct digital design method for reconfigurable multivariable control laws for the A-7D Digitac II aircraft.** D. W. Potts (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and J. D'Azzo (USAF, Institute of Technology, Wright-Patterson AFB, OH). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1284-1291. 8 refs.

This paper investigates control of an aircraft when there is a primary control surface failure. The object of this study is to reconfigure the remaining control surfaces to compensate for the additional forces and moments generated by the inoperative control surface. To study this flight control problem, a comprehensive aircraft model is required which considers each control surface operating individually. A six degree-of-freedom aircraft model is developed, including all the individual control surfaces. The additional coupling between the axes requires the derivation of several new non-dimensional control derivatives. With the new comprehensive aircraft model, the entire eigenstructure assignment method is used to assign both the eigenvalues and the eigenvectors to the closed-loop plant matrix. This method is used for the direct digital design of a multivariable discrete regulator control law. (Author)

A82-14829 **Design of direct digital flight-mode control systems for high-performance aircraft.** B. Porter and A. Bradshaw (Salford, University, Salford, Lancs., England). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1292-1298. 5 refs. Contract No. F49620-81-C-0026.

The general results of Bradshaw and Porter (1981, 1981) on discrete-time tracking systems are used to design fast-sampling error-actuated digital controllers and associated transducers which effect fuselage pitch pointing and vertical translation maneuvers in the case of the F-16 aircraft. It is thus demonstrated that these severe maneuvers can be readily effected by appropriate fast-sampling error-actuated digital controllers which generate practically acceptable flaperon and elevator deflections. Furthermore, it is also demonstrated that such fast-sampling digital controllers are extremely robust. (Author)

A82-14831 **General purpose real-time interaction panel for digital simulation.** M. T. Lansdaal and M. E. McSharry (Boeing Military Airplane Co., Advanced Airplane Branch, Seattle, WA). In: NAECON 1981; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 1305-1310.

Real-time simulations for modelling aircraft or flight control systems often need a controlled real-time event insertion and event monitoring capability. This capability is necessary to study the responses of the simulated system to controlled events or disturbances. A description is presented of an approach providing the solution of event/fault insertion and event monitoring requirements. The approach makes use of an intelligent device, known as the Fault Insertion Panel (FIP), which consists of a minicomputer with a Multiprocessor-Communications Adapter, a Direct Memory Access I/O board, a video terminal, and a hand held control box. The FIP is an inexpensive and versatile replacement for special purpose hardware, such as an aircraft cab/flight deck, and analog instrumentation that must interact with a digital simulation. G.R.

A82-14856 **AN/TPN-25 and AN/GPN-22 precision approach radars.** H. R. Ward (Raytheon Co., Wayland, MA). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 26-31.

A Precision Approach Radar (PAR) is used in a Ground-Controlled Approach (GCA) aircraft landing system to make accurate aircraft position measurements during the final approach to the runway. The PAR recently developed for the U.S. Air Force uses a limited scan phased array to scan, acquire, and track landing aircraft. This paper describes the transportable and fixed-site models of this PAR as well as the results of field tests to verify their coverage and measurement accuracy. (Author)

A82-14857 **Radar hostile fire location.** D. J. Colliver (Royal Signals and Radar Establishment, Malvern, Worcs., England) and J. D. Holcroft (Racal-MESL, Linlithgow, Scotland). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 32-37.

Methods for detecting an attack involving the firing of projectiles are considered, taking into account also the determination of the direction to the source of fire. It is found that for the considered objective, radar-based approaches have important advantages compared to other methods. The requirement for the radar to track projectiles down to short ranges favors the use of a CW system and Doppler processing. Suitable radar hardware is discussed along with aspects of signal processing, taking into account a hybrid processor and a digital processor. Radar systems of the considered type are used in fixed and mobile installations in a security role and have also been installed covertly in armored VIP limousines. Other applications are related to a battlefield environment. G.R.

A82-14868 **Commercial airborne weather radar technology.** G. A. Lucchi (RCA, Avionics Systems Div., Burlington, MA). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 123-130.

From World War II until very recently, there has been little change in the technology of commercial airborne weather radar. The technique being used is still based on the concept of differentiation between various radar backscatter intensities which can be related to rainfall rate. The radar backscatter coefficient for various rainfall rates has been determined sufficiently well for weather radar design calculations. Experiments continue at this time because there are widespread backscatter coefficients depending on such variables as temperature, raindrop size, raindrop shape, and turbulence in the storm cell. Two aircraft were equipped for the conduction of airborne experiments in an attempt to better correlate radar signals with measured turbulence in storm cells. At least three radar manufacturers are developing airborne weather radar systems complying with a new characteristic for a weather radar. Recently a low-cost weather radar system which can be mounted in the leading edge of a single-engine aircraft wing was introduced. G.R.

A82-14871 **Inverse SAR and its application to aircraft classification.** G. Dike, R. Wallenberg (Syracuse Research Corp., Syracuse, NY), and J. Potenza (USAF, Rome Air Development Center, Griffiss AFB, NY). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 161-167.

Two-dimensional radar images of aircraft have been simulated with parameters similar to those of the ARPA/Lincoln C-Band Observables Radar (ALCOR) which has been used in actual radar imaging studies. Development of such a simulation program was necessitated by a need to provide a controlled flight situation to study aircraft image projection planes, and a desire to use the simulation to aid in developing sorting algorithms for use in aircraft classification. The classification approach taken avoids the problem of extraneous responses due to multiple rays, engine modulation, internal antenna scanning, and the addition of stores to the unknown aircraft. A degree of insensitivity to poor focusing is also expected. B.J.

A82-14881 **Air-to-ground MTI radar using a displaced phase center, phased array.** M. L. Stone and W. J. Ince (MIT, Lexington, MA). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 225-230. 5 refs. USAF-sponsored research.

An airborne MTI radar capable of performing surveillance of tactical targets has been assembled and field tested. The design features an electronically scanned displaced phase center antenna, an advanced digital signal processor, and real-time, automated target acquisition and display. The radar represented a scaled model of an all-weather long-range system. Results obtained in the rejection of clutter, the detection of moving targets, and the acquisition and tracking of targets are discussed. (Author)

A82-14908 **A new approach to radar plot extraction for ATC applications.** N. Accarino and E. Giaccari (Selenia S.p.A., Rome, Italy). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 391-396.

It is noted that the capabilities of modern ATC radars require more effective target coordinate evaluation and target resolution capabilities in the extractor than have been available in the past. The availability of powerful processing tools, such as microprocessors, makes possible the implementation of sophisticated algorithms to provide optimum radar plot extraction. A new extraction algorithm, implemented by means of a simulation approach, is described. The improvement in performance is extensively compared with the values obtained using a conventional extractor. The approach described here is given in terms of the following improved characteristics: range and azimuth accuracy, range and azimuth resolution, and target qualification. C.R.

A82-14909 **Extended time radar raw video recording.** R. Inagaki and M. Mochii (Nippon Electric Co., Ltd., Tokyo, Japan). In: International Radar Conference, Arlington, VA, April 28-30, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 397-402.

An attempt is made to develop extended time recording of the radar video for analyzing air traffic control accidents. The combination of a commercial time-lapse video cassette tape recorder and sophisticated video time-compression techniques with radar bandwidth compression demonstrates its validity in realizing 32 hour recording of the ARSR video without deteriorating its image quality from a practical point of view. Improvement in some circuit instability will make it possible to put this newly developed equipment into actual operation in association with magnetic tape recording of the processed digital radar data. C.R.

A82-14927 * **The X-14 - 24 years of V/STOL flight testing.** R. M. Gerdes (NASA, Ames Research Center, Moffett Field, CA). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review*, vol. 16, no. 2, 1981, p. 3-21. 7 refs.

The X-14 V/STOL research aircraft made its first free-hover flight as a proof-of-concept test-bed on Feb. 19, 1957. With the exception of two subsequent modification periods (to X-14A and X-14B) this V/STOL 'workhorse' has been on continuous flight-test status as a research aircraft and flying classroom. The paper presents some of the highlights of its memorable 24-year flight-test career with special emphasis on projects which have contributed to V/STOL technology and on the test pilots who made it happen. (Author)

A82-14928 **Ball-Bartoe Jetwing flight tests.** R. D. Kimberlin (Tennessee, University, Tullahoma, TN). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review*, vol. 16, no. 2, 1981, p. 22-40.

Design features and flight test results of the Jetwing aircraft are reported. The Jetwing employs an upper surface blowing concept in that all engine air is ducted through the leading edge of the wing and ejected over the top surface of the wing through a slot nozzle to achieve supercirculation lift and STOL performance. The nozzle extends over 70% of the wingspan. A Coanda flap is mounted at the trailing edge of the blown portion of the wing and a smaller wing is located over the slot nozzle in low speed flight to reduce installed thrust losses. A test plane with a 21.75 ft wingspan, powered by a single 2200 lb thrust engine, has completed 137 test flights. Test instrumentation is described and in-flight performance with sawtooth climbs at over 55 knots airspeed yielded a lift coefficient of 3.5 and a blowing coefficient of 1.0. Takeoff and landing ground roll were less than 1000 ft, keeping within design goals of a STOL aircraft suitable for aircraft carrier and short, unimproved runway use. D.H.K.

A82-14929 **Flight investigations of integrated descent rate control systems.** W. D. Thompson. *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 41-53.

Results of tests to determine the effectiveness of spoilers for enhancing aircraft landing control are reported. Combining the spoiler with a throttle control formed a descent rate control which improved handling performance, produced effective drag control and lift and moment coupling, and expanded the approach airspeed window. The landing ground distances increased from 600 to 1000 ft as the approach angles increased. The spoiler control is viewed as a glide path control which establishes a linear relationship between rate of sink and throttle position. Inexperienced pilots were able to achieve touch-down accuracies comparable to those displayed by experienced pilots flying normal aircraft. No hard landings were encountered during landing testing, the higher approach speeds simplified landings in gusting conditions, and braking during landing roll was reduced. D.H.K.

A82-14930 **Progress report - CH-47 modernization program.** J. C. O'Connor (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 54-64.

Progress toward improving the CH-47D sufficiently to fill the Army medium lift requirements through the year 2000 is reviewed. The mandatory mission profile includes pick-up of a 15,000 lb load at 4000 ft, at 95 F ambient temperature, climb 200 fpm for one minute, cruise outbound for 30 nm, and return with fuel reserves for 30 nm. The CH-47D employs twin turbine engines, tandem counter-rotating blades, and can transport troops, cargo, and weapons in day, night, visual, and instrument conditions. An adaptation of the Chinook, the CH-47D has a 30 min oil-out capability, has passed through preliminary air evaluation tests, and features an advanced flight control system which allows hands-off flight. Reliability, availability, and maintenance tests revealed no uncorrectable problems after 342 flight hours, although blade coating may be necessitated by a sparkling phenomenon that occurs during night flights in sandy conditions. D.H.K.

A82-14931 **USNTPS spin program.** J. R. Watkins (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 82-86.

The Navy Test Pilot School spin program is described, including test procedures for out of control flight and the aircraft employed. The T-2C Buckeye and X-26A Frigate are the current training aircraft. Students observe upright incipient, oscillatory, and nonoscillating spin and recovery, and are then required to perform similar maneuvers before practicing upright spins as command pilots. Inverted spins are terminated at -1.5 g, and parameters such as minimum entry altitude, mandatory action altitudes, and pre- and post-flight aircraft inspection are outlined. A 30 min out of control flight program is discussed, noting the presence of a chase plane to gather telemetry on rotation, roll, yaw, and pitch/angle rates, and on altitude loss (1000 ft/turn). D.H.K.

A82-14932 **The USAF Test Pilot School high angle of attack and spin training program.** M. D. Edmondson (USAF, Test Pilot School, Edwards AFB, CA). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots Technical Review,* vol. 16, no. 2, 1981, p. 87-91.

The training program at the Air Force Test Pilot School is reviewed. The course is conducted in academic, flight training, and reporting phases, and high angle of attack and spin conditions are accentuated. Students are exposed to in-depth studies of aerodynamic, inertial, gyroscopic, and other forces and moments necessary for fully developed spin. Flight training begins in sailplanes equipped with a tape recorder and a kneeboard, and proceeds to an A-37B with a 42 channel pulse code modulated data acquisition system. Spin missions are safety monitored by an instructor on TV provided by a radar tracking telescope. Spin recoveries in the sailplane and T-37B are described, including erect and inverted spins. An A-7D vehicle is employed for high angle of attack training, noting the hazard of pilot disorientation during high energy departures and rapid angular attitude changes. D.H.K.

A82-14933 **Navy spin evaluation of the A-7 airplane configured with automatic maneuvering flaps.** C. L. White and L. E. Parrish (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 92-107.

Test results of Navy evaluation of automatic maneuvering flaps (AMF) on an A-7B aircraft are presented. The spin characteristics, the effects of asymmetric drop tank loading on the spin characteristics, and the effects of nose-up longitudinal trim on the A-7 departure recovery were examined. The AMF are on both leading and trailing edges of the wings; modifications to the A-7 necessitated by the use of AMF are listed, along with instrumentation and flight test procedures. AMF was found to enhance the departure, spin, and recovery handling characteristics. The asymmetric fuel tank loading was destabilizing at high angles of attack, but was negated by the presence of AMF. Recommended departure procedures were determined as optimal recovery techniques, and details of the flight test maneuvers for spin entry, recovery, and in asymmetric loading conditions are presented. D.H.K.

A82-14934 **F/A-18A high angle of attack/spin testing.** I. M. Behel and W. G. McNamara (U.S. Navy, Naval Air Test Center, Patuxent River, MD). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 108-132.

High angle of attack (AOA) and spin test flights for the F/A-18A aircraft are discussed, noting that high spin resistance features of the control laws necessitated a second, separate set of control laws for spin recovery. Wind tunnel and model testing results are reviewed, with the 16% model yielding more accurate performance prediction than the 6% scale model. The control laws scheduled the maneuvering flaps to increase departure and spin resistance, with full flap extension an optimum configuration for AOA above 25 deg. Instrument feedback for longitudinal stability is outlined and the logic mode for spin recovery is discussed. Finally, the pilot cues, high AOA characteristics, and spin and spin recovery characteristics defined during flight testing are examined, and the benefits of spin recovery cockpit displays for rapid recovery in stressful situations are emphasized. D.H.K.

A82-14935 **KC-10 flight test program.** W. S. Smith (Douglas Aircraft Co., Long Beach, CA) and B. Hinds (USAF, Edwards AFB, CA). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 136-143.

Test features and results of refueling interface with various aircraft with the KC-10 Advanced Tanker/Cargo Aircraft are reported. The program sought to define the performance characteristics and operational capabilities of a converted wide-body commercial plane, the DC-10 freighter, as a military cargo and refueling plane. Modifications for the refueling receptacle slipway, bladder fuel tanks, boom, and hose-drogue refueling system are outlined, along with instrumentation alterations. The KC-10 can carry 356,065 lb of fuel or 85 tons of cargo. Acceptable clearances for ground operations were demonstrated and damping of boom oscillations at high Mach numbers was achieved during tests refueling the C-5. Further tests with the B-52, A-10, F-16, F-4, F-15, A-7D and A-7K, aircraft as receptors were successfully completed. Twelve KC-10 aircraft will be operated to extend the Air Force's worldwide deployment operations. D.H.K.

A82-14936 **The all composite Lear Fan 2100.** H. G. Beaird, Jr. (Lear Fan Corp., Reno, NV). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 144-153.

Design and performance features of the all-composite Lear Fan 2100 aircraft are described. The plane has two engines, one tail-mounted propeller, and can climb at 1400 fpm with one engine out. The structure is a graphite composite, which results in a greater range than with aluminum due to lighter weight, plus a longer lifetime due to higher durability. The engines provide 850 shaft hp apiece, and the metallic content in the oil is electronically monitored to remain within a wide safety margin. Standard ailerons, elevators, and rudders are controlled through cables and pushrods. The operational altitude is 41,000 ft at 435 mph, with the cabin pressurized to 8000 ft; use of one propeller eliminates the occurrence of asymmetric thrust conditions. Overall simplicity, reliability, durability, and safety were the guiding principles in the design of the aircraft. Nominal operation is given as a Mach 0.65 speed and 31,000 ft altitude. D.H.K.

A82-14937 **Acceptance testing of the Calspan variable stability Learjet.** W. J. Brooks, J. W. Smolka (USAF, Test Pilot School, Edwards AFB, CA), R. M. Norman (U.S. Navy, Test Pilot School, Patuxent River, MD), and A. E. Schelhorn (Calspan Advanced Technology Center, Buffalo, NY). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 154-181.

The variable stability system incorporated into a Learjet for use as a flying classroom for USAF and USN Test Pilot students is described. Side-by-side cockpit seating, an observer station, a data station, and the capability of flight in a three-axis, fly-by-wire mode are provided. Various linear and nonlinear flight control system characteristics, along with simulating prefilter effects and transport delay are incorporated in the controls; a number of closed loop flight control system configurations are also included. Components of the variable stability system are discussed, noting the ability of the digitally controlled response feedback system to simulate control reactions of various aircraft in response to the student pilot's control actions when handling numerous aircraft dynamic configurations. D.H.K.

A82-14938 **F-15 SAR.** G. L. Jennings and P. Henry (McDonnell Aircraft Co., St. Louis, MO). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 182-197.

The evolution and capabilities of the F-15 synthetic aperture radar (SAR) as an aid to all weather interdiction capabilities are discussed. The radar has eight components and a 384K memory, with Doppler beam sharpened (DBS) and air-to-ground capability. DBS involves cutting the radar beam into azimuth elements and a processing detection filter in each element; range/azimuth resolution is 250 ft. Design goals of 8.5 ft resolution involve the application of coherent processing, which is the SAR. The antenna senses a point on the ground for a predetermined period of time to produce the required synthetic aperture. The 8.5 ft resolution SAR is currently operational for bombing target identification. D.H.K.

A82-14939 **F/A-18 roll rate improvement program.** M. J. Tkach (McDonnell Aircraft Co., St. Louis, MO). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 198-202.

The roll rate improvements made during the F/A-18 Full Scale Development Program are reviewed. Detection of low wing stiffness and high aerodynamic damping led to thickening the web and caps of the aft main spar and adding additional layers of composites to the skin aft of the main torque box. Roll power was increased by extending the aileron span, implementing differential edge flaps, and increasing the differential tail authority. Steady state roll at altitudes above 10,000 ft resulted. Differential leading edge flaps were then added to prevent roll rate decay at lower altitudes. A position stick will replace the current force stick to allow the F/A-18 to exceed the time-to-bank requirements throughout the flight envelope. D.H.K.

A82-14940 **AV-8B technical update - Leading edge root extension development.** C. A. Plummer (McDonnell Douglas Corp., St. Louis, MO). *(Society of Experimental Test Pilots, Symposium, 25th, Beverly Hills, CA, Sept. 23-26, 1981.) Society of Experimental Test Pilots, Technical Review,* vol. 16, no. 2, 1981, p. 203-209.

The effects of leading edge root extensions (LERX) on the instantaneous turn rate of the AV-8B aircraft are investigated. The LERX was 5.5 ft long with an 11 ft span and an anhedral of 11 deg; the planform comprised 7.5 sq ft/side, for a net gain of 15 sq ft, a net weight of 150 lb, and a shift of the center of gravity by 0.5%. A total of forty-four test flights carrying various weaponry configurations were conducted for data on the full flight envelope. V/STOL, cruise speed, fuel efficiency, maximum speed, and dynamic stability and control were either unchanged or beneficially affected. Buffet was reduced and instantaneous turn rate increased 21%, although some decrease in longitudinal stability was noted. A reduction of the all-composite LERX to 4.2 ft/side lowered the turn rate increase 17% and kept the decrease in longitudinal stability to 2.5%, which was acceptable. D.H.K.

A82-14946 † **Safety of helicopters in flight (Bezopasnost' poletov vertoletov).** A. M. Volodko. Moscow, Izdatel'stvo Transport, 1981. 224 p. 21 refs. In Russian.

Safety-related aspects of single-rotor and coaxial helicopter operation are summarized with reference to aerodynamics, flight dynamics, aeroelasticity, vibrations and dynamic strength of structures, performance of gas-turbine engines and automatic control systems, reliability, crew performance, and aeronautical meteorology. The physical meaning of the principal flight restrictions contained in the flight manual is examined, and possible errors are discussed. Finally, special situations involving complicated flight conditions and equipment failure are discussed along with recommendations on flight safety and accident investigation. V.L.

A82-14952 **U.S. Navy life support development trends.** D. N. DeSimone (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 1-4.

The methodology and trends in navy aircrew life support research and development are reviewed. Life support and survival gear are complementary between all services where flight, safety, escape, or survival functions may overlap. The hardware and procedural use development of any component undergoes exploratory development, advanced development, and advance engineering development before deployment. Research and development activities are initiated to respond to high accident rates, crew member functional constraints, POW reports, and updated logistics systems. Programs currently exploring improvements in environmental and escape systems, fixed seating, parachutes with no maintenance, protective clothing, survival and rescue, and physiological standards for equipment are described. M.S.K.

A82-14953 * **Emergency in-flight egress for general aviation aircraft.** L. J. Bement (NASA, Langley Research Center, Hampton, VA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 16-24.

A NASA program for development of an inflight egress system for the left (pilot) door of general aviation aircraft is described. The pyrotechnic release door was felt to be necessary because of pilot difficulty in reaching the right door when subjected to spin/stall centrifugal effects. A flexible, linear shaped charged of hexanitrostilbene II and a lanyard actuated detonator are discussed, along with mock-up tests and instrumentation. The egress system was designed for minimum structural impact, minimum pilot initiation procedures, low weight, and no egress interference, and to provide sufficient force to blow off the door, have low required maintenance, and high reliability. Results of 66 tests are reviewed, noting the inclusion of a screen to keep glass fragments from spraying the cabin.

Certification was achieved, and uses in the F-111 and B-1 aircraft are noted. M.S.K.

A82-14954 * **Operational evaluation of thunderstorm penetration test flights during project Storm Hazards '80.** G. L. Keyser, Jr., P. L. Deal, B. D. Fisher, and N. L. Crabill (NASA, Langley Research Center, Hampton, VA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 44-49.

The National Aeronautics and Space Administration is conducting a research project called Storm Hazards '80 in order to study the prediction, detectability and avoidance of the hazards of severe storms for aircraft operations. The project, using a highly instrumented NASA F-106B airplane to penetrate thunderstorms, gathered and correlated data from both airborne and ground based instrumentation. The objectives of this project are to determine the effects of lightning on the design and operation of aircraft composite structures and digital electronic systems. The data will be used to determine the correlation of lightning hazards with other severe storm hazards, such as heavy precipitation, hail, turbulence and wind-shear, in order to develop an initial data base for use in design and avoidance. The NASA F-106B was equipped with a weather radar, stormscope, lightning measurement instrumentation and air sampling equipment. This paper will focus on the operational aspects of thunderstorm penetrations and the pilot techniques used to avoid the extremely hazardous portions of the storm such as the tornadoes and hail. It will deal with the effects of the storm elements on the aircraft hardware, avionics and the crew. (Author)

A82-14955 **Testing of the SJU-5A ejection seat for the F/A-18 /HORNET/ aircraft.** T. A. Pavlik (U.S. Naval Air Systems Command, Washington, DC) and B. Macnab (Martin-Baker Aircraft Co., Ltd., Uxbridge, Middx., England). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 62-65.

Results of developmental testing of the F/A-18 ejection seat are discussed. Changes which were required to the basic configuration MK 10 seat included standard U.S. materials and processes, environmental sealing of the mechanical devices, redundancy of critical components, single point safety handling, incorporation of a navy seat kit, oxygen, and restraint system, and incorporation of parachute water pockets. Difficulties encountered due to the intercontinental distribution of production and testing sites are outlined, and the parachute, pyrotechnic device, and survival kit are considered, noting that testing comprised 14 ejections at speed from 0-600 knots. The seat is now standard equipment on the F/A-18. M.S.K.

A82-14956 **Rescue at sea.** R. G. Eberhardt (U.S. Naval Weapons Center, Parachute Systems Dept., China Lake, CA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 66, 67.

The Sea Water Activated Release System (SEAWARS) Program has the objective of reducing the number of aircrew-member drownings that occur after a successful ejection and parachute descent into the ocean. This paper addresses the historical evolution and development of the SEAWARS Program, a brief overview of the system requirements, preliminary Navy evaluation, and current program status. (Author)

A82-14958 **'Little people' problem /MA-2 torso harness/.** V. M. Voge (U.S. Navy, Naval Safety Center, Norfolk, VA) and H. Pheeny (U.S. Naval Weapons Center, China Lake, CA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 76-79.

Changes necessary to the MA-2 torso harness to accommodate use by smaller people, notably females, are described. Measurements of flying personnel weighing less than 140 lb and shorter than 66 in. resulted in a decision to keep the between-K-fitting-distance at a minimum of 7.5 in., which serves as a disqualification level. An adjustable cinch strap has been added to the leg straps to compensate for people who are big enough, yet experience difficulties with proper fitting. Best fit requirements are presented, noting that people who cannot be fit with a standard harness are candidates for custom-fit harnesses. Research into a nylon system with greater negative and lateral g restraint features is indicated. M.S.K.

A82-14960 **Automatic parachute releasers for premeditated parachuting.** E. Puskas (Para-Flite, Inc., Pennsauken, NJ). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 84-86.

This paper is presented to inform members of the organization of the state of the art of 'Automatic Parachute Opener' design, specifically the design of those used for premeditated parachuting. This presentation covers the history, the philosophy used in establishing design parameters, the technical differences in design dictated by specific applications, the description and the differences in technology of the two primary design approaches currently in use, current trends in utilization, and direction that development of these devices will take in the foreseeable future. (Author)

A82-14961 **The history of the development of the GQ aeroconical parachute - 1971-1980.** A. J. Harrison (GQ Defence Equipment, Ltd., Woking, Surrey, England). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 93-96.

Development and testing of the GQ aeroconical parachute, which is used to all variants of the MK 10 ejection seat, are reviewed. The chute has a 36 in. diameter vent, equalling 18% of the flying diameter. Two 11.7 sq ft panels positioned to the rear of the canopy at a 45 deg angle from the axis of symmetry allow a positive forward gliding component. Details of the structural materials are presented, and 55 medium/high speed trial drop tests are described. A 20.3 ft/sec rate of descent is provided by the chute, a rate which is not necessarily affected by torn seams. Results of ejection seat tests are provided, noting functional success at Mach 0.98 at 14,000 ft with a maximum deceleration of 26.6 g. The chute inflates within 1.22 sec, deployment occurs at 64 ft/sec, and water pockets are included in the design to collapse the chute within 5 sec of a water landing. M.S.K.

A82-14963 **A new safety harness for mobile aircrew.** D. C. Reader (USAF, School of Aerospace Medicine, Brooks AFB, TX). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 106-109.

A safety harness for mobile crewmembers in both fixed and rotary winged aircraft has been designed. It consists of a self-tightening assembly of straps attached to a life preserver which is attached to an aircraft strong point by a strap with length adjustment. The safety harness has been assessed for comfort, compatibility with other items of aircrew equipment, strength in suspension and drop tests, and is now recommended for service trial. (Author)

A82-14965 **Further test results of parachutes with automatic inflation modulation /A.I.M./.** D. B. Webb (Irvin Industries Canada, Ltd., Fort Erie, Ontario, Canada). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 116-123.

An automatic inflation modulation canopy for the next generation of ejector seats is described. The parachute features the use of unidirectional Kevlar stretch fabric in the crown area of the canopy and an auxiliary parachute inside the main canopy mouth. The intent is to reduce the overall recovery flight path distance with a lower peak opening force. A network of reefing lines are organized, i.e. kept from tangling, by a central marquisette, which is held at a fixed point in the center of the canopy by a positioning line connected to the center point of the canopy. Whirl tower, overinflation and descent control, and deployment tests results are reported, and a 29.6 ft diam parachute was shown to display overinflation control, steady state stability, and consistency of inflation timing at speeds up to 275 knots at 16,000 ft. M.S.K.

A82-14969 **A look at the Hoffman Triangular parachute - The first successful glidable parachute.** D. Gold (U.S. Naval Weapons Center, Parachute Systems Dept., China Lake, CA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 124-131.

The development of the Hoffman Triangular parachute is described. Several designs were considered and a cloverleaf configuration with a 26 ft canopy was chosen. A short skirt opposite a lineless tail allowed for an increase in the glide velocity of the canopy. The pilot parachute also featured four vanes, a springless elastic container flap system to throw the chute away from the jumper, and rubber bands to retain bighted suspension lines in the container. The company that produced the parachute failed in business but the use of the rubber bands to retain the suspension lines became a standard feature of parachute containers. M.S.K.

A82-14972 **Evaluation of a selected group of anti-exposure garment configurations for their effects on the operational performance and survival of Naval aircrewmen.** S. M. Reaps, D. C. Johanson, and L. J. SantaMaria (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 183-191.

A82-14974 **Test and evaluation of improved aircrew restraint systems.** G. T. Singley, III (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 196-201. 7 refs.

U.S. Army aviation accident data shows that a majority of all injuries in attack helicopters could have been avoided if these aircraft had been equipped with crashworthy seat and restraint systems. The compactness of the cockpit and the close proximity of mission equipment to the aircrew in attack and scout helicopters pose serious crash impact hazards. Although not desirable from a crashworthiness standpoint, operational considerations may dictate that mission equipment and structure be located within the occupant's crash impact motion envelope. Given this situation, it is critical to the occupant's crash impact survival chances that he be provided with a restraint system that minimizes his crash impact motion envelope, particularly for his head. The cockpit can be delethalized further when the improved restraint is complemented by padding potential strike surfaces in the cockpit, making contact surfaces frangible, and providing weapon system sights with frangibility, telescoping, and/or swingaway features. This paper presents the results of an effort to test and compare the potential of several aircrew restraint systems to reduce the crash impact motion envelope of helicopter aircrewmen. (Author)

A82-14975 **Design of a crashworthy crew seat for the Boeing Vertol Chinook helicopter.** R. F. Campbell (Boeing Vertol Co., Philadelphia, PA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 202-208.

The design and test results of a crashworthy seat for the Chinook are presented. Requirements for the seat included the ability to withstand a crash pulse of 30 g peak with a 50 fps velocity change, and a vertical pulse of 48 g peak with a 42 fps velocity change, based on a 0.065 sec pulse duration. An armored bucket capable of protecting against a 30 cal projectile at 100 m was fabricated, and three adjustable attenuator wires were added, each sized to stroke at 600 lb over the seven in. minimum stroking distance. Features of the support structure, the armored Kevlar bucket, cushions, restraints, and testing procedures are outlined, and current work on a self-adjusting, infinitely variable attenuator is indicated, as a means to provide a constant inertia system. M.S.K.

A82-14976 **Crashworthy military passenger seat development.** L. Domzalski (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 209-215. 11 refs.

The performance criteria, design concepts, and test results for Navy crashworthy, fixed-wing aircraft passenger seats are reviewed. Noting the enhanced crashworthiness of a rearward-facing seat, crash pulses with 30 deg pitch, 19 deg roll, and 30 deg yaw are mentioned as dynamic test criteria. Ultimate static loading factors are defined, and the lack of velocity change data from accident investigation reports is stressed as a deficiency. A two passenger seating arrangement with a total weight of 56 lb was chosen, and included a double harness/lap-belt configuration. A steel bench able to withstand a velocity change of 64 fps while supporting two 250 lb passengers resulted, with a maximum energy absorber force setting of 3000 lb on the leg struts. Tests of the seat showed a resistance to up to 8 g force (4000 lb), about half the requirements, and indicate a need to redesign to comply with rearward and lateral static load/deflection criteria. M.S.K.

A82-14977 **HASEP - Survival from crashed Navy helicopters.** J. Micciche (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA) and J. J. Iatesta (Sanders and Thomas, Inc., Pottstown, PA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 216-220. 6 refs.

The Navy's Helicopter Aircrew Survivability Program (HASEP) was originally planned to enhance the inflight recovery and survival capability for helicopter aircrewmen. HASEP, more recently, has been directed to eliminate inflight recovery. It focuses on the survival technologies with high near term payoff. The currently active technologies are discussed, taking into account the H-46 helicopter emergency flotation system, the helicopter emergency egress lighting system, a comparison of underwater helicopter escape lights, the H-46 crashworthy cargo restraint, a crashworthy troop seat integration for H-46, and an automatic life raft system. G.R.

A82-14978 **Analysis of escape systems at 687 KEAS.** D. T. Ther and R. F. Yurczyk (Boeing Military Airplane Co., Seattle, WA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 221-225. Contract No. F33615-79-C-3406.

Attention is given to the Advance Ejection Seat program which was concerned with the selection of deployable aerodynamic devices to reduce the acceleration levels of an ejection seat. The object of this program was to find a configuration which could operate at a dynamic pressure of 1600 psf and satisfy the acceleration requirement of MIL-S-9479B. Estimated aerodynamic coefficients were used in a three degree of freedom simulation to select a set of configurations which seemed sufficiently promising to be analyzed in a wind tunnel. Refined aerodynamic coefficients were obtained from wind tunnel tests and these data were used in the simulation to select the final configuration. The simulations show that improvement of seat acceleration performance is a complex problem which is not solvable by simply reducing drag. It was found that control of seat attitude and stability is essential to good acceleration performance. G.R.

A82-14979 **Wind tunnel tests of ejection seat for high dynamic pressure escape.** J. O. Bull and R. F. Yurczyk (Boeing Military Airplane Co., Seattle, WA). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 226-230. USAF-supported research.

In connection with the employment of the currently used, multimode, rapidly sequenced ejection system, it was found that a higher injury and fatality rate resulted from more ejections at high speed. A program was initiated to evaluate advanced ejection seat concepts for escape in the high dynamic pressure regime (1600 PSF or 687 KEAS). A description is presented of the wind tunnel test phase of the program. Wind tunnel data were obtained on 12 high Q ejection seat configuration variations. Complete six component data were obtained throughout an angle of attack, angle of yaw, and Mach number range to obtain a basis for conducting six-degree-of-freedom computer simulations of ejection seat stability, trajectory, and performance characteristics. Based on a preliminary review of the data, a seat with 18 deg boom and stabilizer and a seat with 18 deg boom and stabilizer plus a flow diverter appear to be the most viable candidates for the high Q ejection seat. G.R.

A82-14980 **Performance assessment of the ACES-II ejection seat-A-10 configuration.** E. O. Roberts (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 231-234.

A brief overview is presented of a performance analysis of the ACES-II ejection seat for the A-10 aircraft. The analysis is conducted with the aid of a computer simulation program, called SAFEST, which stands for Simulation and Analysis of In-Flight Escape System Techniques. A comparison between track test results and the computer simulation has shown very good simulation. This correlation indicates that complete simulation has now been realized. The obtained results can be used to design and develop new and improved escape systems at lower costs. The analysis proves the value of computer simulation in the design and the evaluation of ejection seat systems. G.R.

A82-14981 **Post ejection survival.** B. Limbrey (Martin-Baker Aircraft Co., Ltd., Uxbridge, Middx., England). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 235-238.

The causes of fatalities occurring during escapes involving ejection seats are examined. It is found that 62% of fatalities were due to striking the ground before the parachute had time to develop. The second principal cause of fatality is drowning or lost at sea, presumed drowned (25%). The remaining causes of fatality are many and varied and each makes up only a very small proportion of all fatalities. Approaches are discussed for aiding the aviator who descends on his parachute into the sea. Attention is given to fatalities occurring in the cases of a single point parachute release and a multiple parachute release. It was found that the number of fatalities for single point releases was much smaller than for multiple releases. G.R.

A82-14982 **Terrain actuated deployment system.** J. K. Seitler (ARO Corp., Buffalo, NY). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 239-244.

A description is presented of a radar altimeter which was developed to automatically detect when an ejectee, after man-seat separation, and a five second delay reaches a height of 500 through 100 feet above the terrain. The radar altimeter then triggers the deployment of the survival kit and subsequent inflation of the life raft contained in the survival kit. The radar altimeter uses a solid-state transmitter and a tuned RF receiver at the transmitter frequency. Sufficient sensitivity and selectivity is assured by RF amplification and filtering. The video processing and timing circuits process received terrain echos only if they exceed the threshold level and are associated with heights of from 100 to 500 feet. G.R.

A82-14983 **A system safety program for aircraft production and deployment.** L. E. Rackley (General Dynamics Corp., Fort Worth, TX). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 245-249.

Changes are sometimes made to an aircraft without adequate consideration of system safety or other specialty engineering aspects. An investigation is conducted concerning the implementation of suitable approaches for avoiding such a neglect with respect to vital system characteristics. It is found to be important that system safety is also considered during design changes made after fleet deployment. System safety considerations should have a significant effect on the decision making process of implementing the change. In order to follow the given recommendations, however, it will be necessary to establish an adequate system safety data base during the development phase and maintain it through the production phase and as long after fleet deployment as necessary. G.R.

A82-14984 **A ballistic design model for initiators for aircraft personnel escape systems.** B. E. Paul (SCOT, Inc., Downers Grove, IL). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 250-252.

In a review of the T-38 interseat sequencing system, it was found that more information was needed regarding the pressure history in an initiator system. In response to this observation, a ballistic model was developed which characterizes the entire pressure-space-time function in the initiator. The model was applied to two diverse initiators. The correlation was found to be quite good. The model was also applied to conditions which yielded rather high in-tube peak pressures, and predicted a similar occurrence. It was then used to establish a method for improvement of this condition. It appears that the model can be efficiently utilized for the development of any new initiator system or the modification of current systems. The model is capable of handling layouts with multiple branches and/or multiple initiator sources. G.R.

A82-14985 **Analytical and experimental characterization of the JAU-14/A cartridge actuated initiator for use in aircrew escape system performance evaluation.** A. M. Varney, R. J. Brandstadt, J. D. Martino (Applied Combustion Technology, Inc., Orlando, FL), and J. L. Hinds (U.S. Navy, Naval Ordnance Station, Indian Head, MD). In: Survival and Flight Equipment Association, Annual Symposium, 18th, San Diego, CA, October 12-16, 1980, Proceedings. Canoga Park, CA, Survival and Flight Equipment Association, 1981, p. 253-255.

A82-14998 † **The technology of sheet-metal stamping in the production of aircraft /2nd revised and enlarged edition/ (Tekhnologiia zagotovitel'no-shtampovochnykh rabot v proizvodstve samoletov /2nd revised and enlarged edition/).** M. N. Gorbunov. Moscow, Izdatel'stvo Mashinostroenie, 1981. 224 p. 43 refs. In Russian.

The general characteristics of sheet-metal stamping operations are discussed, followed by a detailed description of the individual stamping procedures. This includes the location and spacing of blanks, and means of improving the quality of the cutting edge. The bending method is then described, including a discussion of the stress-strain state, the minimal radius of bending, bending with tangential tension and compression, and bending with radial compression. The flanging and expansion processes are discussed, as is stretch-wrap forming, molding, and die forging. Attention is also given to the stamping of more complicated shapes and to other methods of stamping in the production of aircraft. J.F.

A82-15311 **Prediction and performance of radome-covered reflector antennas.** P. J. B. Clarricoats, C. G. Parini, and M. S. A. S. Rizk (Queen Mary College, London, England). *(International Union of Radio Science, Symposium on Electromagnetic Waves, 10th, Technische Universität München, Munich, West Germany, Aug. 26-29, 1980.) Radio Science,* vol. 16, Nov.-Dec. 1981, p. 1106-1110. Research supported by the Science Research Council.

The return loss (reflection coefficient) of a paraboloidal radome is predicted by a physical optics method based on the power-coupling theorem. An asymptotic form of the reflection coefficient is found to be very accurate and consistent with a simple geometric optics interpretation. A method to reduce the return loss is investigated using a hemispherical iris-loaded sandwich section of the center of the radome, and an improvement of approximately 5 dB is observed over a useful frequency bandwidth. Contributions of the radome to the radiation pattern of the antenna are identified, and those near to boresight are predicted. D.L.G.

A82-15468 # **A criterion for determining the causes of wind shear at Punta Raisi Airport, on the basis of statistical data from barograph records (Ricerca di un criterio per la determinazione delle**

cause dal wind-shear verificatosi nell'aeroporto di Punta Raisi attraverso i dati statistici rilevati da registrazioni barografiche). O. Cosentino (Aeronautica Militare, Servizio Meteorologico, Rome, Italy) and G. Ferlazzo (Palermo, Università, Palermo, Italy). *Rivista di Meteorologia Aeronautica,* vol. 41, Apr.-June 1981, p. 127-135. 7 refs. In Italian.

A statistical analysis has been conducted on pressure jumps appearing in the barograph records of Punta Raisi airport, which are compared with such corresponding meteorological parameters as wind, temperature and humidity in order to determine the synoptic, local and orographic causes of the phenomena. Attention is given the characteristics and causes of wind shear in the geographical context of the airport, and it is concluded that prefrontal or frontal pressure variations accompanied by local elevation phenomena with cumulus clouding result in horizontal wind shear over the area in which barometric jumps are experienced. O.C.

A82-15482 † **Study of the load-carrying capacity of aviation gas-turbine engine impellers under low-cycle loading at normal and high temperatures (Issledovanie nesushchei sposobnosti rabochikh koles kompressorov aviatsionnykh GTD pri malotsiklovom nagruzhenii v usloviiakh normal'noi i povyshennykh temperatur).** V. G. Bazhenov, A. D. Baliuk, B. G. Reznik, and V. P. Gontarovskii (Kievskii Politekhnicheskii Institut, Zhitomir, Ukrainian SSR). *Problemy Prochnosti,* Nov. 1981, p. 45-48. In Russian.

A rotor was designed for testing the impeller of gas-turbine engines under low-cycle loading, considering the force interaction of neighboring stages. The stress-strain state of a disk of an impeller was calculated by means of an algorithm based on the finite element method and the theory of small elastoplastic deformations. The load-carrying capacity of the impeller is estimated under conditions approximating those found in a real operational environment. J.F.

A82-15596 **Direct free-flight analysis of aircraft dynamics at high angles of attack.** M. E. Beyers (South African Council for Scientific and Industrial Research, National Institute for Aeronautics and Systems Technology, Pretoria, Republic of South Africa). *Aeronautical Society of South Africa and South African Institute of Aeronautical Engineers, Journal,* vol. 2, no. 1, 1981, p. 17-28. 28 refs.

Concepts are examined for the analysis of high-maneuverability aircraft dynamics on the basis of gross flight-dynamic effects observed in wind-tunnel free-flight experiments. Experimental and analytical techniques developed to study the generic nonoscillatory free-flight motion of flight vehicles trimmed at significant angles of attack, are reviewed. The feasibility of aircraft model free-flight tests is demonstrated on the basis of simulations and trajectory validation schemes are proposed for the corroboration of free-flight and captive-model dynamic data. Finally, the rationale underlying the utilization of data gathered in captive- and free-model dynamic stability tests of high-performance aircraft is examined in the context of design objectives of high maneuverability and good flying qualities. (Author)

A82-15597 **A matter of seconds - A critical account of three notable air disasters /5th Major Miller Memorial Lecture/.** C. S. Margo. *Aeronautical Society of South Africa and South African Institute of Aeronautical Engineers, Journal,* vol. 2, no. 1, 1981, p. 30-35.

Three aircraft accidents are analyzed for causes and remedies. A DC-10 crash of May 25, 1979, comprised the loss of an engine on take-off and subsequent loss of control leading to grounding 31 sec later. Continued unsymmetric repair, maintenance, and replacement of the engines from one side or the other had led to structural failure, and loss of control occurred in the absence of stall indication and power from the side of the lost engine. An increase of speed is judged to have been capable of preventing the crash. Although little evidence was left after the accident that killed Dag Hammarskjold, an evaluation is given that the pilot's knowledge of the height above sea level was uncertain. Finally, a crash of a Boeing 707 on April 20, 1968 is determined to have happened because of premature transition from take-off to climb power. It is noted that the pilot had had a total of one hour's experience with that particular version of the 707. M.S.K.

A82-[illegible] **Computer image generation for flight simulation.** B. J. Schachter (Westinghouse Defense and Electronics Systems Center, Baltimore, MD). *IEEE Computer Graphics and Applications,* vol. 1, Oct. 1981, p. 29-32, 34-38, 40-48 (17 ff.). 130 refs.

The features and capabilities of computer image generation for producing effective imagery for flight simulation are explored. CRT operational parameters designed to meet necessary realism for human visual interaction are outlined, noting the eye's tendency to concentrate on one small area of resolution at a time. Four currently available systems are examined, along with control logic, the NASA three-view space flight simulator, and block diagrams of information routing. VLSI processors, holographic image displays, interactive computer graphics, and optical disks are considered for advanced simulator systems. M.S.K.

A82-[illegible] **Experimental investigation of total pressure loss and airflow distribution for gas turbine combustors.** Z.-M. Fan and Z.-F. Chao (China Gas Turbine Research Institute, People's Republic of China). *(Journal of Engineering Thermophysics,* vol. 1, May 1980, p. 186-194.) *Engineering Thermophysics in China,* vol. 1, Apr.-June 1980, p. 207-217. Translation.

Results of theoretical and experimental investigations are presented to demonstrate the feasibility of a solution for certain one-dimensional simultaneous equations. The current flow drag method and the hole blanketing experimental method are shown to have difficulties, and a simple technique of calculation using the mean flow coefficient is provided. Results of calculations in accordance with the one-dimensional flow simultaneous solution are compared with those obtained with the mean flow coefficient method and experimental results, showing good agreement. D.L.G.

A82-15625 **Large terminal maneuvering areas: Operational problems - Possible development of solutions (Les grandes zones de manoeuvre terminale: Problèmes opérationnels - Evolution possible des solutions).** J.-L. Garnier (Direction de la Navigation Aérienne, Paris, France). *(Organisation Européenne pour l'Equipement Electronique de la Navigation Aérienne, Forum Technique, Rome, Italy, May 15, 1981.) Navigation (Paris),* vol. 29, Oct. 1981, p. 443-451. In French.

The operational problems associated with large terminal maneuvering areas (TMAs) are examined, and means by which these problems may be alleviated by the use of expected technological advances are considered. The TMA is defined as the region of space occupied by flights departing from or having a destination in the area concerned, within which aircraft are climbing towards or descending from their cruise levels. Means currently in use for the management of air traffic within a TMA such as that of Paris are indicated. Current problems arising in the use of TMAs are attributed to the phenomena of high traffic levels and the necessity of standbys in the presence of the competing priorities of large capacity and user economics. The possible contributions of the DABS selective addressing secondary radar system, MLS and precision DME to the resolution of these problems are examined, and it is concluded that while all these techniques have their place in the TMAs of the future, additional measures in the areas of onboard navigation equipment, automated ground assistance and traffic control systems are required. A.L.W.

A82-[illegible] † **Current aerial cameras (Sovremennye aerofotoapparaty).** V. G. Afremov and V. B. Il'in. *Geodeziia i Kartografiia,* Oct. 1981, p. 40-42. 6 refs. In Russian.

The paper considers the development and operation of the TE and TES aerial cameras, having focal distances of 200, 100, 70, and 50 mm and FOV angles of 40, 103, 120, and 136.5 deg, respectively, for 18 x 18 cm frames. The basic technical characteristics and some applications of these cameras are presented. B.J.

A82-15721 † **Quality optimization and unification of aviation gasolines (Optimizatsiia kachestva i unifikatsiia aviatsionnykh benzinov).** V. E. Emel'ianov, K. A. Demidenko, and B. A. Englin (Vsesoiuznyi Nauchno-issledovatel'skii Institut Neftianoi Promyshlennosti, Moscow, USSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 11, 1981, p. 18, 19. In Russian.

The introduction of a new process for the production of aviation gasolines based on reformed gasoline has made it possible to optimize the quality of aviation gasolines with respect to their chemical stability, tar content, iodine number, and the content of an antioxidizer. The principal properties of gasolines B-91/115, B-95/130, and B-100/130 are briefly reviewed. It is proposed to replace the aviation gasolines currently in use with a single gasoline type, B-91/115, with an octane number of not less than 95. V.L.

A82-15723 † **Optimization of requirements on the pitting-prevention properties of turbojet-engine oils (Optimizatsiia trebovanii k protivopittingovym svoistvam masel dlia turboreaktivnykh dvigatelei).** B. S. Gutenev, A. V. Vilenkin, G. T. Novosartov, V. G. Gorodetskii, and B. F. Kirdakov. *Khimiia i Tekhnologiia Topliv i Masel*, no. 11, 1981, p. 30, 31. 5 refs. In Russian.

Analysis of the operating conditions of bearings in turbojet engines shows that the probability of trouble-free bearing service is reduced with increasing temperatures and loads. In order to increase the service life of turbojet-engine bearings, a study has been carried out with the aim of improving the pitting-prevention properties of MS-8p oil. This objective has been achieved by substituting a chlorine-containing additive for a phosphorus-containing additive. V.L.

A82-15724 † **Efficient use of working fluids in aviation hydraulic systems (Ratsional'noe primenenie rabochikh zhidkostei v aviatsionnykh gidravlicheskikh sistemakh).** B. G. Bedrik, V. S. Ugriumov, and A. F. Iakovleva. *Khimiia i Tekhnologiia Topliv i Masel*, no. 11, 1981, p. 33-35. In Russian.

Changes in the quality of working fluids in the hydraulic equipment of aircraft in the process of equipment operation are analyzed. It is shown that by scheduling fluid replacement with allowance for the actual condition of the fluid, it would be possible to reduce fluid consumption by 1.5-2 times without a tradeoff in equipment reliability. V.L.

A82-15748 **A VHF homing system with VHF radio-telephony for area-representative strip-survey flights conducted, as part of combined forest inventories, with light aircraft carrying 70 mm and 35 mm cameras (Ein VHF-Homing-System mit VHF-Sprechfunk für flächenrepräsentative Streifenbefliegungen mit 70 mm und 35 mm Kameras von leichten Flugzeugen im Rahmen kombinierter Waldinventuren).** B. Rhody (Bundesforschungsanstalt für Forst- und Holzwirtschaft, Hamburg, West Germany). *Bildmessung und Luftbildwesen*, vol. 49, Nov. 1, 1981, p. 199-203. In German.

A82-15816 **Computer-animated predictive displays for microwave landing approaches.** S. N. Roscoe (New Mexico State University, Las Cruces, NM) and R. S. Jensen (Ohio State University, Columbus, OH). *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-11, Nov. 1981, p. 760-765. 55 refs.

It is shown that a safe, orderly, and economical flow of air traffic at congested metropolitan airports can be ensured by microwave radio guidance systems. By furnishing aircraft position in three dimensions, these terminal navigation aids potentially allow steeply curved landing approaches that will faciliate unprecedented noise abatement procedures, large fuel savings, and precisely timed arrivals at airport runways. To implement such complex flight procedures, a combination of semiautomatic computer-assisted airplane guidance and control and radically different flight displays will be required if pilots are to monitor such maneuvers confidently and execute them manually when necessary. Results of a simulator investigation, involving visual guidance and flight-path prediction embedded in computer-animated contact analog displays, show that pilots can reliably execute computer-programmed curved approaches to airport runways with the required precision in the face of severe wind shears. C.R.

A82-15823 **The influence of wind shear and vertical winds on takeoffs and go-arounds.** R. König and P. Krauspe (Braunschweig, Technische Universität, Braunschweig, West Germany). *Airport Forum*, vol. 11, Oct. 1981, p. 43-46. 8 refs.

The effects of wind shear and vertical winds on aircraft takeoffs and go-arounds is discussed. It is noted that with the advent of a more modern autopilot generation and advanced wind-shear warning indicators, landing accidents due to wind shear will be avoidable. Hazards posed by low-velocity downdrafts and wind shear in the lee of a large-surface obstacle are also considered with reference to studies made a a German airport and with simulators. Operational considerations of wind shear are assessed. S.C.S.

A82-15824 **'In situ' composites for jet propulsion and stationary gas turbine applications.** W. Bunk (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Werkstoff-Forschung, Cologne; Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany) and P. R. Sahm (Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). *Zeitschrift für Werkstofftechnik*, vol. 12, Oct. 1981, p. 345-359. 25 refs. Research supported by the Bundesministerium für Forschung und Technologie.

Examples of reinforced superalloys for high temperature applications in jet engines are reported. The phase stability of microstructures is tested with a high thermal gradient device, and first engine tests of directionally solidified Co-Cr7C3 eutectic alloy are reported. Properties such as creep behavior, fatigue, and oxidation resistance are measured and compared with corresponding data for both conventionally and directionally cast Ni-base superalloy IN 738. First engine tests of 18,000 hrs with unalloyed Co-Cr7C3 vanes indicate the importance of a fully eutectic microstructure and stability against carbide transformations. D.L.G.

A82-15827 **Rapid elliptic solvers.** R. W. Hockney (Reading, University, Reading, Berks., England). In: Numerical methods in applied fluid dynamics. London and New York, Academic Press, 1980, p. 1-48. 37 refs.

Rapid direct methods for the solution of certain classes of elliptic partial differential equations (pde) have been in use for over ten years. Such methods are based on Fourier analysis, cyclic reduction, and optimal combinations of the two. To classify as a Rapid Elliptic Solver (RES), the algorithm must solve the elliptic equation of an (n x n) mesh in a number of floating-point arithmetic operations which corresponds approximately to the source of n. The methods are also characterized by the minimum use of storage. A number of different RES algorithms for the solution of pde's are considered, taking into account questions concerning the choice of algorithm, the method of Fourier Analysis and Cyclic Reduction (FACR), the cyclic reduction process, marching methods, and a comparison of programs. Attention is also given to nonseparable equations, and the N-body problem. G.R.

A82-15835 **Remarks on the calculation of transonic potential flow by a finite volume method.** A. Jameson (New York University, New York, NY). In: Numerical methods in applied fluid dynamics. London and New York, Academic Press, 1980, p. 363-386. 18 refs. Contract No. N00014-77-C-0032.

The development of a finite volume method for the numerical calculation of transonic flow is considered. It is assumed that the flow is irrotational, so that the velocity can be represented as the gradient of a potential. Essentially this limits the application of the method to flows containing fairly weak shock waves, for which the Mach number of the normal component of the velocity ahead of the shock is not substantially greater than 1.3, since shock waves are to be modelled by isentropic jumps. The formulation of the equations is discussed, taking into account the case of a wing or wing-body combination in a uniform stream. The discrete approximation to the equations is developed by using a subdivision of the domain into distorted cubic cells. The developed procedure is applied to the study of swept wings. The results of the calculations encourage confidence in the usefulness of the potential flow model for engineering predictions. G.R.

A82-15845 # **Robust flight control - A design example.** S. N. Franklin (Systems Control Technology, Inc., Palo Alto, CA) and J. Ackermann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Dynamik der Flugsysteme, Oberpfaffenhofen, West Germany). *Journal of Guidance and Control*, vol. 4, Nov.-Dec. 1981, p. 597-605. 6 refs. Research supported by the

Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt; Grant No. AF-AFOSR-78-3633; Contract No. N00014-79-C-0424.

A novel parameter space method is used as a tool for the design of a robust stabilization system for the short-period longitudinal mode of a fighter aircraft. The example is an F-4E with additional horizontal canards. Robustness is achieved, in the sense that military specifications for damping and natural frequency are satisfied, by a constant controller in spite of perturbations. The perturbations are changing flight conditions and undetected sensor failures. The resulting controller structure requires two gyros and one accelerometer. The system, including actuator dynamics and feedback dynamics, is of sixth order and, in the design, four free controller parameters have been assumed. Practical considerations are taken into account, such as bandwidth limitation below structural vibration frequencies, actuator limitations, and relaxed emergency specifications in failure situations. (Author)

A82-15846 # **Airplane performance sensitivities to lateral and vertical profiles.** J. C. Wauer, J. M. H. Bruckner (Rockwell International Corp., Cedar Rapids, IA), and C. H. Humphrey (United Air Lines, Inc., San Francisco, CA). *Journal of Guidance and Control*, vol. 4, Nov.-Dec. 1981, p. 606-613. 11 refs.

Airplane performance sensitivity to the choice of lateral and vertical profiles is studied based on data recorded on in-service flights of a 727-200 airplane equipped with JT8D-7 engines. Lateral profile performance sensitivity is based on analysis of flight technical or guidance error and on varying degrees of direct flight clearance. Vertical analysis is based on an aerodynamic simulation of the recorded flights. Sensitivity to the choice of vertical profile is studied by simulating the actual profile that was flown, two perfectly flown constant IAS/Mach profiles, and minimum-cost and minimum-fuel optimum profiles. Some of the practical considerations in implementing the real-time optimum profile algorithms and some of the difficulties encountered with the optimum profile computations are discussed. Predicted fuel and time savings are related to the air traffic control (ATC) environment experienced by the airlines to obtain net savings predictions with varying degrees of ATC restriction. (Author)

A82-15847 * # **Experimental evaluation of a perspective tunnel display for three-dimensional helicopter approaches.** A. J. Grunwald (Technion - Israel Institute of Technology, Haifa, Israel), J. B. Robertson, and J. J. Hatfield (NASA, Langley Research Center, Flight Electronics Div., Hampton, VA). *Journal of Guidance and Control*, vol. 4, Nov.-Dec. 1981, p. 623-631. 11 refs.

A computer-generated perspective tunnel display for a steep and strongly curved three-dimensional helicopter approach is studied. The necessary control variables for following a curved trajectory are analyzed, the effectiveness of superimposed predictor symbology is investigated, and a suitable predictor law is formulated. The theoretical considerations are validated by an extensive fixed-base simulator program. The tunnel display with a superimposed predictor symbol is shown to outperform conventional-type displays in its abilities to follow a curved trajectory in the presence of gust disturbances, to enter the trajectory from an unknown position outside this trajectory, as well as to monitor automatic approaches. The feasibility of the tunnel display for operation in actual flight has been demonstrated in an exploratory flight test. (Author)

A82-15864 **Mathematical programming in engineering design problems.** H. J. Baier (Dornier System GmbH, Friedrichshafen, West Germany). In: Numerical optimization of dynamic systems. Amsterdam, North-Holland Publishing Co., 1980, p. 391-410. 19 refs.

The application of mathematical programming to engineering design problems is considered. After the statement of the problem some real-world applications are discussed and some comments on the impact of mathematical programming on the engineering design process are made. Sequential unconstrained minimization technique, sequential linear programming and Lagrangian multiplier methods are presented as three important representatives of optimization algorithms in this field of application. The discussion of some special features shows what can be undertaken to improve their relative performance. Finally an assessment of these algorithms is made. (Author)

A82-15866 # **High voltage/high power for airborne applications.** F. C. Brockhurst (USAF, Institute of Technology, Wright-Patterson AFB, OH) and M. P. Dougherty (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH). *IEEE Transactions on Aerospace and Electronic Systems*, vol. AES-17, Nov. 1981, p. 795-801. 16 refs.

Advancements made in technologies required for lightweight, high voltage, high power, airborne power systems are discussed. Programs to reduce the weight of rotating machines, transformers, switches, inverters, and capacitors are described, and some aspects in the use of these components in the design of lightweight systems are considered. Interactive programs already developed allow the designer to analyze circuit performance and perform component and limited system design, while additional programs are planned with emphasis on quick response, ease of use, and versatility. D.L.G.

A82-15869 **CT7 - GE attacks commuter turboprop market.** J. Moxon. *Flight International*, vol. 120, Nov. 21, 1981, p. 1572, 1575, 1576.

A description is given of the design features and performance capabilities of the CT7 turboprop engine, which is intended for commuter aircraft of the 30-35 seat class. The 1700 shaft horsepower engine employs a combined axial/centrifugal compressor to achieve a pressure ratio of 17:1 and turbine entry temperatures of over 1200 C. Emphasis is put on the engine's maintainability, which allows field changes of all modules with only a 12-piece standard tool kit. It is claimed that the CT7 engine core is 30% more fuel efficient than the CT58 helicopter engine core which it is scheduled to replace. The engine incorporates a centrifugal inlet separator that rejects 85-95% of all sand and dust. The reliability of the CT7 is in part due to the development and operational experience accumulated with the T700 military turboshaft, on which its design is based. O.C.

A68-[illegible] High voltage/high-power [illegible] [illegible] Aerospace [illegible] Electronic Systems [illegible]

[illegible] high voltage, high power, airborne power systems are discussed. Programs to reduce the weight of rotating machines, transformers, [illegible] and capacitors [illegible] analyses [illegible] performance and [illegible] systems design, [illegible]

A68-[illegible] [illegible] engine [illegible] ratio of [illegible] 1700 [illegible]

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Transfer Functions [illegible]

[illegible]

[illegible] Sensitivity to the choice of [illegible]

[illegible]

[illegible] Mathematical programming [illegible]

[illegible] mathematical programming on the engineering [illegible] are made. Sequential unconstrained minimization [illegible] Finally an assessment of these [illegible] is made.

STAR ENTRIES

N82-12030 Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
THE NUMERICAL SOLUTION OF INCOMPRESSIBLE TURBULENT FLOW OVER AIRFOILS Ph.D. Thesis
Harwood Allen Hegna 1981 166 p
Avail: Univ. Microfilms Order No. 8119138

An algebraic eddy viscosity turbulence model based on Prandtl's mixing length theory was modified for separated adverse pressure gradient flows. Finite difference methods for solving the inviscid stream function equation and the incompressible laminar Navier-Stokes equations were used. A finite difference method for solving the Reynolds averaged incompressible turbulent two-dimensional Navier-Stokes equations were employed. Solutions for a NACA 0012 airfoil at angles of attack varying from five to 11.5 degrees at a chord Reynolds number of 170.000 were obtained. Velocity profiles near the airfoil surface and surface pressure distributions are presented and compared with experimental data. Lift and drag coefficients agree well with experimental values. Dissert. Abstr.

N82-12031 Arizona Univ., Tucson.
SUBCRITICAL AND SUPERCRITICAL AIRFOILS FOR GIVEN PRESSURE DISTRIBUTION Ph.D. Thesis
Ahmed Abdelatif HassanElsaa 1981 82 p
Avail: Univ. Microfilms Order No. 8121930

An effective method, based on hodograph theory, was developed for the aerodynamic design of subcritical and shock-free supercritical airfoil sections. In addition to the free-stream conditions, the input to the design procedure includes a prescription of the subsonic part of a target pressure distribution and, for supercritical airfoils, of a presumed stream function on the sonic line. A computer program carries out a number of sequential steps that result in an airfoil with a pressure distribution close to that desired at little computational cost. Thus, the airfoil designer can alter the input if design goals are not met and quickly produce another candidate airfoil. This is aided by appropriate graphic display of the airfoil and its pressure distribution. Dissert. Abstr.

N82-12041*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROELASTICITY MATTERS: SOME REFLECTIONS ON TWO DECADES OF TESTING IN THE NASA LANGLEY TRANSONIC DYNAMICS TUNNEL
Wilmer H. Reed, III Sep. 1981 13 p refs Presented at the Intern. Symp. on Aeroelasticity, Nuremberg, West Germany, 5-7 Oct. 1980 - 1 Oct. 1981
(NASA-TM-83210) Avail: NTIS HC A02/MF A01 CSCL 01A

Testing of wind-tunnel aeroelastic models is a well established, widely used means of studying flutter trends, validating theory and investigating flutter margins of safety of new vehicle designs. The Langley Transonic Dynamics Tunnel was designed specifically for work on dynamics and aeroelastic problems of aircraft and space vehicles. A cross section of aeroelastic research and testing in the facility since it became operational more than two decades ago is presented. Examples selected from a large store of experience illustrate the nature and purpose of some major areas of work performed in the tunnel. These areas include: specialized experimental techniques; development testing of new aircraft and launch vehicle designs; evaluation of proposed 'fixes' to solve aeroelastic problems uncovered during development testing; study of unexpected aeroelastic phenomena (i.e., 'surprises'); control of aeroelastic effects by active and passive means; and, finally, fundamental research involving measurement of unsteady pressures on oscillating wings and control surfaces. A.R.H.

[illegible] National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EXPERIMENTAL AND ANALYTICAL STUDIES OF A MODEL HELICOPTER ROTOR IN HOVER
F. X. Caradonna and C. Tung Sep. 1981 37 p refs Presented at the 6th European Rotorcraft and Powered Lift Aircraft Forum, Bristol, England, 16-19 Sep. 1980 Prepared jointly with Army Aviation Research and Development Command
(NASA-TM-81232; A-8332; USAAVRADCOM-TR-81-A-23) Avail: NTIS HC A03/MF A01 CSCL 01A

A benchmark test to aid the development of various rotor performance codes was conducted. Simultaneous blade pressure measurements and tip vortex surveys were made for a wide range of tip Mach numbers including the transonic flow regime. The measured tip vortex strength and geometry permit effective blade loading predictions when used as input to a prescribed wake lifting surface code. It is also shown that with proper inflow and boundary layer modeling, the supercritical flow regime can be accurately predicted. J.M.S.

N82-12047# ARO, Inc., Arnold Air Force Station, Tenn.
EVALUATION AND WIND TUNNEL TESTS OF THE 4,000 LB (NORMAL-FORCE) PITCH/YAW AND ROLL DYNAMIC STABILITY BALANCE SYSTEMS FOR MEASURING DIRECT, CROSS, AND CROSS-COUPLING DERIVATIVES Final Report, 5 Jan. 1978 - 25 May 1979
T. D. Buchanan, S. M. Coulter, and E. J. Marquart Sep. 1981 79 p refs
(AD-A105122; AEDC-TR-80-13) Avail: NTIS HC A05/MF A01 CSCL 20/4

Early in the 1970's, the personnel of the Arnold Engineering Development Center (AEDC) recognized the need for a set of new dynamic test mechanisms for testing aircraft models at high angles of attack. At these angles of attack cross and cross-coupling derivatives may be significant in determining the aircraft's stability. Dynamic balances were fabricated to perform pitch, yaw, and roll dynamic stability tests of aircraft or large missile models at AEDC. The balances were designed to measure not only the direct derivatives but also cross and cross-coupling derivatives. The set of balances comprises a 4,000-lb (normal-force) roll and a 4,000-lb pitch/yaw forced-oscillation balance to measure the direct damping derivatives and a five-component cup-type balance to measure the cross and cross-coupling derivatives attributable to pitch or yaw. Extensive laboratory investigations of the balances' static and dynamic response characteristics were performed before wind tunnel tests of a 1/9-scale F-16A model in the AEDC Propulsion Wind Tunnel (16T) at Mach numbers from 0.2 to 1.3. GRA

N82-12050
APPLICATION OF SINGULAR PERTURBATION THEORY TO ONBOARD AIRCRAFT TRAJECTORY OPTIMIZATION Ph.D Thesis
Abhijit J. M. Chakravarty 1981 139 p
Avail: Univ. Microfilms Order No. 8121183

The problem of minimizing direct operating cost in dollars (combined cost per hour and cost of fuel per hour) for a typical commercial jet transport model is formulated via the Pontryagin minimum principle. Singular perturbation theory is applied to reduce the computational burden of solving the resulting optimal control problem. The work of previous investigators is extended to include the aircraft weight equation in the state equations and the resulting seven-state model is analyzed for time scale separation. It is shown that a realistic time scale separation involves only two scales. The resulting model is then used to develop the inner and outer solutions as dictated by singular perturbation theory. Both the free terminal time problem and the time controlled 4-D problem are considered. A comprehensive model for the aerodynamic and fuel flow terms appearing in the equations is developed for use in optimal trajectory computation. Numerical results are presented that illustrate the nature of the optimal trajectory and the control variables. Dissert. Abstr.

N82-12051*# Virginia Univ., Charlottesville. School of Engineering and Applied Science.
TRANSPORTATION SYSTEMS EVALUATION METHODOLOGY DEVELOPMENT AND APPLICATIONS, PHASE 3 Final Report
A. Robert Kuhlthau, I. D. Jacobson, and L. C. Richards Jul. 1981 82 p

(Contract NAS1-14906)
(NASA-CR-164999; UVA/528175/MAE-CE81/101) Avail: NTIS HC A05/MF A01 CSCL 01B

Transportation systems or proposed changes in current systems are evaluated. Four principal evaluation criteria are incorporated in the process, operating performance characteristics as viewed by potential users, decisions based on the perceived impacts of the system, estimating what is required to reduce the system to practice; and predicting the ability of the concept to attract financial support. A series of matrix multiplications in which the various matrices represent evaluations in a logical sequence of the various discrete steps in a management decision process is used. One or more alternatives are compared with the current situation, and the result provides a numerical rating which determines the desirability of each alternative relative to the norm and to each other. The steps in the decision process are isolated so that contributions of each to the final result are readily analyzed. The ability to protect against bias on the part of the evaluators, and the fact that system parameters which are basically qualitative in nature can be easily included are advantageous. S.L.

N82-12052*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INVESTIGATION OF SEVERE LIGHTNING STRIKE INCIDENTS TO TWO USAF F-106A AIRCRAFT
J. Anderson Plumer Hampton, Va NASA. Langley Research Center Sep. 1981 19 p
(Contract NAS1-15864)
(NASA-CR-165794; LT-80-56) Avail: NTIS HC A02/MF A01 CSCL 01C

The results of the inspection and analysis of two F-106A aircraft that were struck by separate lightning strikes within a few minutes of each other are presented. Each aircraft sustained severe lightning strikes to the pitot booms, resulting in extensive damage to the pitot heater power harness, number 8 ground wire, and lightning suppressors, but there was no damage to either aircraft's electrical or avionic systems. A simulated lightning current of 226 kA and 3.8 million A(2)*S was required to reproduce the damage to the ground wires in the radomes. Photographs and detailed assessments of the damage are included. R.J.F.

N82-12053# Federal Aviation Administration, Washington, D.C. Office of Aviation Medicine.
AN ANALYSIS OF CIVIL AVIATION PROPELLER-TO-PERSON ACCIDENTS: 1965-1979
William E. Collins, Angelo R. Mastrullo, William R. Kirkham, Deborah K. Taylor, and Paula M. Grape May 1981 13 p refs
(AD-A105365; FAA-AM-81-15) Avail: NTIS HC A02/MF A01 CSCL 01/2

The interest of manufacturing, governmental, and safety personnel using paint schemes on propeller and rotor blades is based on improving the visual conspicuity of those blades when they are rotating. While propeller and rotor paint schemes may serve to reduce the number of fatalities and injuries due to contact with a rotating blade there is little information available regarding analyses of the circumstances surrounding such accidents. Brief reports provided by the National Transportation Safety Board of all 'propeller-to-person' accidents from 1965 through 1979 were examined and analyzed in terms of airport lighting conditions, actions of pilots, actions of passengers and ground crew, phase of flight operation, weather conditions, and others. Analyses based on a total of 319 accidents showed a marked drop in the frequency of 'propeller-to-person' accidents from 1975 through 1978. Several types of educational efforts directed toward pilots and ground crew, both prior to and during that 4-year period, were examined as possible factors contributing to the accident rate decline. Accident patterns provide a basis for assessing the probable efficacy of various recommendations (including propeller conspicuity) for further reducing 'propeller-to-person' accidents. Author (GRA)

N82-12054# Federal Aviation Administration, Washington, D.C. Office of Aviation Safety.
COMPUTER AIR CARRIER SYMPOSIUM
16 Jan. 1981 248 p refs Symp. held at Washington, D.C., 15-16 Jan. 1981
(AD-A104894; FAA-ASF-300-81-6) Avail: NTIS HC A11/MF A01 CSCL 01/2

Partial Contents: Working Session I -- Simulation, Fitness, and Safety Analysis; Working Session II -- Airports and Airways; and Working Session III -- Human Factors. GRA

N82-12055# Federal Aviation Administration, Washington, D.C. Office of Aviation Safety.
SUMMARY OF FEDERAL AVIATION ADMINISTRATION RESPONSES TO NATIONAL TRANSPORTATION SAFETY BOARD SAFETY RECOMMENDATIONS Quarterly Report, Jan. - Mar. 1981
R. E. Livingston and C. A. Carpenter Apr. 1981 243 p refs
(AD-A104922; FAA-ASF-81-3) Avail: NTIS HC A11/MF A01 CSCL 01/2

This report contains NTSB recommendations and all FAA responses to Board recommendations that were delivered to the Board during the applicable quarter. In addition, the report includes NTSB requests and FAA responses concerning reconsiderations, status reports, and followup actions. The Table of Contents for this report reflects only those NTSB recommendations which are still open pending FAA action (i.e., those that have not been designated as 'Closed' by the NTSB as a result of acceptable action). Accordingly, the Table of Contents may reflect a number of multiple recommendations (example: A-79-21 through 24), but background material is included only for those recommendations which remain in an 'Open' status. Background information for those recommendations which have been closed is available in FAA Headquarters files. Author (GRA)

N82-12056# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
INDEX OF NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER TECHNICAL REPORTS 1972 - 1977 Final Report, 1972 - 1977
Ruth J. Farrell, comp. and Nancy G. Boylan, comp. May 1981 201 p
(FAA Proj. 999-113-000)
(AD-A104759; FAA-CT-81-54) Avail: NTIS HC A10/MF A01 CSCL 01/3

This report is an index of all technical reports which were assigned NA numbers and published by NAFEC during the period 1972 through 1977. Entries are arranged by NA number and include titles, authors and full abstracts. Separate sections contain indexes by subject, author, and RD number. Author (GRA)

N82-12057# Textron Bell Helicopter, Fort Worth, Tex.
INVESTIGATION OF THE STRUCTURAL DEGRADATION AND PERSONNEL HAZARDS RESULTING FROM HELICOPTER COMPOSITE STRUCTURES EXPOSED TO FIRES AND/OR EXPLOSIONS Final Report, Mar. 1979 - Dec. 1980
Raymond J. Schiltz, Jr. Aug. 1981 111 p refs
(Contract DAAK51-79-C-0009; DA Proj. 1L1-62209-AH-76)
(AD-A104757; USAAVRADCOM-TR-81-D-16) Avail: NTIS HC A06/MF A01 CSCL 13/12

A program was undertaken to investigate the structural degradation and personnel hazards resulting from exposure of helicopter composite structures to fire and/or explosion. The program consisted of a technical survey, a test program, and an analysis phase. A major part of the technical survey was a literature survey. In addition, organizations working in the fields of interest were contacted for information, and some were visited for further, detailed discussions. The computer programs currently available for modeling enclosure fires were screened, and one was chosen for further study. The test program consisted of a series of tests on two representative helicopter structures: a sheet-stiffened, built-up door of Kevlar 49 fabric impregnated with an epoxy resin, and a honeycomb sandwich fuselage shell structure of graphite/epoxy fabric skins on a Nomex honeycomb core. The tests conducted on materials from these structures were smoke generation tests, and structural degradation tests. Ballistic tests on the complete test article were conducted to determine whether the structures would ignite under HEI impact conditions. Based on the survey and testing, design criteria for structural composite components were investigated and, when appropriate, formulated. Author (GRA)

N82-12058# Federal Aviation Administration, Atlantic City, N.J.
FLIGHT EVALUATION OF LORAN-C AS A HELICOPTER NAVIGATION AID IN THE BALTIMORE CANYON OIL EXPLORATION AREA Final Report, Mar. - May 1979
William A. Lynn May 1981 43 p

(FAA Proj. 045-390-130)
(AD-A106260; FAA-CT-80-53; FAA-RD-81-37) Avail: NTIS
HC A03/MF A01 CSCL 17/7

A series of flight tests were conducted to investigate the use of long range navigation (LORAN)-C as a helicopter navigation system in the offshore New Jersey Baltimore Canyon oil exploration area. Tests were flown aboard the Federal Aviation Administration (FAA) Technical Center's CH-53A using a Teledyne Systems TDL-711 LORAN Micro-Navigator. The purpose of the tests was to determine the accuracy and operational usability of LORAN-C for offshore en route navigation and nonprecision approaches. The total system accuracy met or exceeded the requirements of Advisory Circular (AC) 90-45A 'Accuracy Requirements of Area Navigation Systems' for terminal and en route phases of flight, provided the proper LORAN triads were selected. The LORAN-C System did not meet AC 90-45A nonprecision approach accuracy criteria. Author (GRA)

N82-12060# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
THE USE OF GROUNDSPEED, IN A WIND SHEAR AND THE FLIGHT EVALUATION OF A RADAR-ALTIMETER-BASED SYSTEM FOR THE MEASUREMENT OF GROUNDSPEED Final Report, Jan. 1979 - Oct. 1980
David Lawrence Jul. 1981 44 p refs
(AD-A104758; FAA-CT-81-34; ACT-100F) Avail: NTIS
HC A03/MF A01 CSCL 04/2

The use of groundspeed in combination with airspeed has been considered and shown to be an effective aid in the execution of an approach and landing in a heavy jet transport airplane. A flight dynamics analysis shows that the response of such aircraft to sudden changes in headwind is quite sluggish, requiring more than 100 seconds for equilibrium conditions to be regained in the worst case. A feasibility demonstration model of a radar-altimeter-based system for the measurement of groundspeed has been subjected to a limited in-flight evaluation. It is a self-contained unit requiring no ground-based equipment and no on-board equipment other than the small flush transmit and receive antennas and the associated cable runs. While the current unit does not meet the desired accuracy standard (within + or 3 knots, or less), it approaches it at times, and greater accuracy can be achieved with further development. Responsiveness to rapidly changing groundspeed matched that of the reference inertial navigation system; and satisfactory groundspeed tracking was maintained during turning, climbing, and descending flight. Author (GRA)

N82-12061# Ohio Univ., Athens. Dept. of Electrical Engineering.
MLS PERFORMANCE ASSESSMENT, TASK 4. VOLUME 1: EVALUATION PROCEDURES AND EQUIPMENT DESIGN Final Report
Robert W. Lilley, Richard H. McFarland, and Walter D. Phipps
Dec. 1980 93 p refs
(Contract DOT-FA79NA-6020)
(AD-A106993; EER-47-2-Vol-1; FAA-CT-81-60-Vol-1) Avail: NTIS HC A05/MF A01 CSCL 17/7

Preliminary flight-check procedures and system tolerances for the Microwave Landing System (MLS) are presented. A data-collection and recording package for use in light-aircraft measurement of MLS parameters in support of the System Test and Evaluation Program (STEP) is included containing a ground reference system, digital telemetry link airborne MLS sensor unit and system computation/display element. Author (GRA)

N82-12062# Teledyne Systems Co., Northridge, Calif.
DESIGN STUDY REPORT FOR GENERAL AVIATION LORAN-C RECEIVER Final Report
H. L. Walker and R. Ellerbe May 1981 257 p
(Contract DT-FA01-80-C-10108)
(AD-A104921; FAA/RD-81/38) Avail: NTIS
HC A12/MF A01 CSCL 17/7

This document summarizes the results of studies and trade-off analysis conducted for a low cost Loran-C Receiver. The Loran-C Receiver is intended to meet the Minimum Operational Performance Standards for area Navigation (RNAV) equipment for General Aviation Aircraft operating in the National Airspace System. The studies and analysis examined the required receiver performance, design approaches and design criteria and cost to the user of the receiver. The study concludes that a low cost receiver meeting the General Aviation RNAV requirements is practical. A design approach for the receiver is described. Author (GRA)

N82-12063# Technische Hogeschool, Delft (Netherlands).
ORIENTING DESCRIPTION OF AIR TRAFFIC CONTROL IN THE NETHERLANDS [ORIENTERENDE BESCHRIJVING VAN DE LUCHTVERKEERSBEVEILIGING IN NEDERLAND]
W. H. vonTuijl Aug. 1979 54 p refs In DUTCH
(VTH-LR-289) Avail: NTIS HC A05/MF A01

A general impression is given of air traffic control (ATC) in the Netherlands and of the signal automatic radar data processing (SARP) air traffic control system for Schiphol airport emphasizing safety and efficiency. Flight conditions, air structure, and navigation and landing aids of the ATC system are discussed. In the SARP system, data relative to position and flight plans are, on a real time basis, processed by a set of computers and distributed. Task sharing in SARP, its technical layout, its operational layout, operational functions and flight data are reviewed. Author (ESA)

N82-12064# National Aerospace Lab., Amsterdam (Netherlands). Flight Div.
THE EFFECT OF VISUAL INFORMATION ON MANUAL APPROACH AND LANDING
P. H. Wewerinke 28 Apr. 1980 20 p refs Presented at 16th Ann. Conf. on Manual Control, Cambridge, Mass., 5-7 May 1980 Abbreviated version of NLR-TR-80055-U
(NLR-MP-80019-U; NLR-TR-80055-U) Avail: NTIS
HC A02/MF A01

The effect on approach performance of visual scene information, in combination with basic display information, is discussed for the manual approach and landing task. Good, poor and night visibility conditions are considered, combined with basic head-up display configurations representing a variety of visual cues (runway contours, etc). A pre-experimental model analysis was performed in terms of an optimal control model. The resulting aircraft approach performance predictions were compared with the results of a moving base simulator program. The results illustrate that the model provides a meaningful description of the visual (scene) perception process involved in the complex (multivariable, time varying) manual approach task with a useful predictive capability. The theoretical framework is shown to allow a straight forward investigation of the complex interaction of a variety of task variables. Author (ESA)

N82-12065*# Foster-Miller Associates, Inc., Waltham, Mass.
EXPERIMENTAL AND ANALYTICAL STUDIES OF ADVANCED AIR CUSHION LANDING SYSTEMS Final Report
E. G. S. Lee, A. A. Boghani, K. M. Captain, H. J. Rutishauser, H. L. Farley, R. B. Fish, and R. L. Jeffcoat Washington NASA Nov. 1981 196 p refs
(Contract NAS1-15051)
(NASA-CR-3476) Avail: NTIS HC A09/MF A01 CSCL 01C

Several concepts are developed for air cushion landing systems (ACLS) which have the potential for improving performance characteristics (roll stiffness, heave damping, and trunk flutter), and reducing fabrication cost and complexity. After an initial screening, the following five concepts were evaluated in detail: damped trunk, filled trunk, compartmented trunk, segmented trunk, and roll feedback control. The evaluation was based on tests performed on scale models. An ACLS dynamic simulation developed earlier is updated so that it can be used to predict the performance of full-scale ACLS incorporating these refinements. The simulation was validated through scale-model tests. A full-scale ACLS based on the segmented trunk concept was fabricated and installed on the NASA ACLS test vehicle, where it is used to support advanced system development. A geometrically-scaled model (one third full scale) of the NASA test vehicle was fabricated and tested. This model, evaluated by means of a series of static and dynamic tests, is used to investigate scaling relationships between reduced and full-scale models. The analytical model developed earlier is applied to simulate both the one third scale and the full scale response. B.J.

N82-12066# Aeronautical Research Labs., Melbourne (Australia).
FLIGHT TRAIL OF THE AIRCRAFT FATIGUE DATA ANALYSIS SYSTEM (AFDAS) MK. 2 PROTOTYPE
P. J. Howard Dec. 1980 37 p refs
(AD-A106270; ARL/STRUC-NOTE-[illegible]; AR-002-[illegible]) Avail: NTIS HC A03/MF A01 CSCL 01/3

A prototype version of the Aircraft Fatigue Data Analysis System (AFDAS) has been evaluated in flight trials in a comparison with continuously recorded data. Over a limited period of test the range-mean-pairs count of strain cycles was the same for both sets of data, and the gains calculated for the AFDAS are identical to those deduced from the continuous record. Author (GRA)

N82-12067# General Electric Co., Binghamton, N.Y. Aircraft Equipment Div.
ELECTRONIC MASTER MONITOR AND ADVISORY DISPLAY SYSTEM (EMMADS) Final Report, Jun. 1977 - Jun. 1981
Jun. 1981 38 p refs
(Contract DAAK80-79-C-0270; DA Proj. 1L2-62202-AH-85)
(AD-A105082; ACS-12386; USAAVRADCOM-TR-79-F-270)
Avail: NTIS HC A03/MF A01 CSCL 01/3

The design and fabrication of a programmable feasibility model of an electronic master monitor and advisory display system for helicoptrs is described. Functional requirements and system interfaces for signal analysis were determined for the helicopters studied. Human factors studies developed formats for reducing crew workloads and maximizing crew performance. Methods of data transfer from sensors to the monitor system were analyzed and appropriate interfaces and data transmission media were recommended. The programmable feasibility model is discussed. R.J.F.

N82-12069# Aeronautical Research Labs., Melbourne (Australia).
A VAPOUR CYCLE CABIN COOLING SYSTEM FOR THE SEA KING MK.50 HELICOPTER
Brian Rebbechi Feb. 1980 59 p refs
(AD-A105211; ARL/MECH-ENG-155; AR-001-793) Avail: NTIS HC A04/MF A01 CSCL 13/1

An experimental determination has been made of the design requirements for a cabin cooling system in the Sea King Mk. 50 helicopter. The purpose of this system is to bring the cabin environment in the helicopter to an acceptable level for effective crew performance. Cooling was provided by an experimental vapour cycle cooling system. Results of the trials have been used to formulate a heat transfer model of the cabin to enable prediction of required cooling capacity for extreme climatic conditions. A comparison, based on the trials results, is made between the performance attainable by a vapour cycle cooling system, and an air cycle system using the available engine bleed. Author (GRA)

N82-12070# Hochschule der Bundeswehr, Munich. (West Germany). Flugmechanik und Flugfuehrung.
EFFECTS OF AERODYNAMIC COUPLING ON THE DYNAMICS OF ROLL AIRCRAFT
Gottfried Sachs and Werner Fohrer Jan. 1981 48 p refs In GERMAN; ENGLISH summary
Avail: NTIS HC A03/MF A01

The effects of coupling of longitudinal and lateral aerodynamic characteristics on the dynamics of aircraft roll were studied, using simplified relations and complete six-degree of freedom calculations. The aerodynamic coupling is caused by unsymmetric flow conditions resulting from sideslipping, where rolling moments due to angle of attack and pitching moments due to angle of sideslip, are of particular significance for the problem. It is shown that the attainable rate of roll is significantly influenced and that marked effects on stability are possible. Furthermore, it is shown that aerodynamic coupling can cause autorotation, i.e., a rolling motion without aileron forcing moments. Author (ESA)

N82-12072# Engins Matra, Velizy (France). Lab. Central.
ADVANTAGES AND LIMITATIONS OF VARIOUS MATERIALS USED IN THE CONSTRUCTION OF MODULES [ATOUT ET LIMITES D'EMPLOIS DES DIVERS MATERIAUX UTILISES DANS LA CONSTRUCTION DES CELLULES]
G. Hilaire 30 Jul. 1981 39 p In FRENCH Presented 9th Colloq. Aciers et Alliages Speciaux dans les Ind. Aerospatiales, Le Bourget, France, 11 Jun. 1981
(SNIAS-812-551-103; C-42796) Avail: NTIS HC A03/MF A01

Steels, light alloys, titanium alloys, and composites are compared for economy, mechanical characteristics, energy content, fatigue effects and toughness. The use of these materials in civil and military aircraft, helicopters, and engines is surveyed. Increasing use of composites is forecast for the next decade, with a corresponding drop in the use of light alloys. Steels and titanium alloys should not be affected. Author (ESA)

N82-12074# Air Force Flight Test Center, Edwards AFB, Calif. Flight Dynamics Div.
AFFTC STANDARD AIRSPEED CALIBRATION PROCEDURES Final Report
Albert G. DeAnda Jun. 1981 182 p refs
(AD-A104830; AFFTC-TIH-81-5) Avail: NTIS HC A08/MF A01 CSCL 01/4

This handbook has been compiled as a reference for use by AFFTC flight test engineers in the standard flight test methods, techniques and procedures for airspeed calibrations. Suggested airspeed calibration data reduction methods are presented. Some of the information included in this reference applies to the local AFFTC facilities; however, the data reduction outlines are for general application. Author (GRA)

N82-12075*# General Electric Co., Lynn, Mass. Aircraft Engine Group.
EFFECT OF A PART SPAN VARIABLE INLET GUIDE VANE ON TF34 FAN PERFORMANCE Final Report
Jose Alvarez and Paul W. Schneider Sep. 1981 133 p refs
(Contract NAS3-21624)
(NASA-CR-165458; R81AEG030) Avail: NTIS HC A07/MF A01 CSCL 21E

Experimental aerodynamic and performance data were obtained from a TF34 engine. Part span variable inlet guide vanes mounted in front of the fan on the TF34 engine were tested to demonstrate the feasibility of modulating air flow and thrust for vertical takeoff aircraft systems. The fan was mapped to stall for a range of speeds and variable inlet guide vane settings. Modulated fan tip performance and unmodulated hub performance were evaluated with a without an extended fan bypass splitter. The effect of a crosswind distortion screen on performance was also evaluated. R.J.F.

N82-12076# Aeronautical Research Labs., Melbourne (Australia). Mechanical Engineering Dept.
VIBRATION TEST PROCEDURES FOR ACCESSORY ANGLE DRIVE GEARBOXES ON ATAR 09C ENGINES
P. D. McFadden and D. H. Edwards Mar. 1981 57 p refs
(AD-A105269; ARL/MECH-ENG-TM-408; AR-002-284) Avail: NTIS HC A04/MF A01 CSCL 21/5

The Accessory Angle Drive gearbox powers the fuel and hydraulic pumps on the Atar engine in the Mirage aircraft. To insure against in-flight failure, each gearbox is vibration tested under load after overhaul by the local contractor. A new vibration testing technique, offering greatly improved accuracy and reliability, has been developed. The technique uses a real-time, fast-fourier spectrum analyzer, with direct digital read-out in engineering units, and a tracking adapter with built-in antialiasing filter. This report defines correct procedures for the connection and operation of the instruments, and the interpretation of the results. Author (GRA)

N82-12077# Lucas Group Services Ltd., Solihull (England).
THE USE OF METAL FINISHING IN AIRCRAFT FUEL SYSTEMS
S. L. Forgham and H. L. Tulloch 1981 28 p refs
Avail: NTIS HC A03/MF A01

Topics discussed are: (1) corrosion resistant finishes; (2) finishes to aid manufacture; (3) repair and overhaul; and (4) bearing finishes. In the case of (1) hydrogen embrittlement is identified as a major problem and processes generating hydrogen at the surface should be closely controlled. Results on drawing size of cadmium plating of rotor blades are presented. Various techniques of electrodepositing are compared. Pump rig tests on fuels containing chlorides, showing the effect on torque of additives after a 5 hr run and an additional 16 hr standing, are reported. Author (ESA)

N82-12078# European Space Agency, Paris (France).
THREE DIMENSIONAL FLOW INVESTIGATION WITH A METHOD OF CHARACTERISTICS IN THE INLET REGION AND THE BLADE-TO-BLADE CHANNELS OF SUPERSONIC AXIAL COMPRESSORS Ph.D. Thesis - Paris Univ. 6
Jean Martinon Sep. 1981 341 p refs Transl. into ENGLISH of 'Etude, au moyen d'une methode de bicaracteristiques, de l'ecoulement tridimensionnel dans la region d'entree et les canaux interaubes d'une roue de compresseurs axiaux supersoniques', ONERA, Paris Report ONERA-P-1979-1, 1979 Original report in FRENCH previously announced as N80-23325
(ESA-TT-637; ONERA-P-1979-1) Avail: NTIS

HC A15/MF A01

A three dimensional method of characteristics is developed for the calculation of the supersonic flow in the inlet region and the blade-to-blade channels of blade cascades and high transonic axial flow compressors with subsonic or supersonic axial velocity. The numerical scheme is accurate, and required computer times are short. Results of calculations on several linear or annular cascades and rotating blade rows are presented and compared with test results. Author (ESA)

N82-12079*# Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
RELIABILITY ANALYSIS OF THE F-8 DIGITAL FLY-BY-WIRE SYSTEM
L. D. Brock and H. A. Goodman Oct. 1981 182 p refs
(Contract NAS4-2871)
(NASA-CR-163110; R-1324) Avail: NTIS HC A09/MF A01 CSCL 01C

The F-8 Digital Fly-by-Wire (DFBW) flight test program intended to provide the technology for advanced control systems, giving aircraft enhanced performance and operational capability is addressed. A detailed analysis of the experimental system was performed to estimated the probabilities of two significant safety critical events: (1) loss of primary flight control function, causing reversion to the analog bypass system; and (2) loss of the aircraft due to failure of the electronic flight control system. The analysis covers appraisal of risks due to random equipment failure, generic faults in design of the system or its software, and induced failure due to external events. A unique diagrammatic technique was developed which details the combinatorial reliability equations for the entire system, promotes understanding of system failure characteristics, and identifies the most likely failure modes. The technique provides a systematic method of applying basic probability equations and is augmented by a computer program written in a modular fashion that duplicates the structure of these equations. S.L.

N82-12080*# Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Aerospace and Ocean Engineering.
COMPUTATIONAL METHODS OF ROBUST CONTROLLER DESIGN FOR AERODYNAMIC FLUTTER SUPPRESSION Final Report, 14 Nov. 1980 - 15 Nov. 1981
Leonard R. Anderson 15 Nov. 1981 96 p refs Presented at the 3rd Intern. Conf. on Math., Calif., 28-31 Jul. 1981 Submitted for publication
(Grant NAG1-80)
(NASA-CR-164963; VPI-Aero-125) Avail: NTIS HC A05/MF A01 CSCL 01C

The development of Riccati iteration, a tool for the design and analysis of linear control systems is examined. First, Riccati iteration is applied to the problem of pole placement and order reduction in two-time scale control systems. Order reduction, yielding a good approximation to the original system, is demonstrated using a 16th order linear model of a turbofan engine. Next, a numerical method for solving the Riccati equation is presented and demonstrated for a set of eighth order random examples. A literature review of robust controller design methods follows which includes a number of methods for reducing the trajectory and performance index sensitivity in linear regulators. Lastly, robust controller design for large parameter variations is discussed. R.J.F.

N82-12081# Tel-Aviv Univ. (Israel). Dept. of Electronic Systems.
FIXED GAIN CONTROLLER DESIGN FOR AIRCRAFT Final Scientific Report, 1 Jun. 1980 - 31 May 1981
Yoram Baram and Doron Eidelman 30 Jun. 1981 31 p refs
(Grant AF-AFOSR-0178-80; AF Proj. 2301)
(AD-A104877; ESTTR-81-06; SCIENTIFIC-2; EOARD-TR-81-10) Avail: NTIS HC A03/MF A01 CSCL 01/3

A Method for designing fixed gain controllers and filters for systems with large parameter variation is presented. The approach, based of minimax information criteria, is used to design a non-adaptive back-up control system for a given aircraft and is shown to provide good performance qualities. Author (GRA)

N82-12082*# Computer Sciences Corp., Mountain View, Calif.
SIMULATOR CERTIFICATION METHODS AND THE VERTICAL MOTION SIMULATOR Final Report
Thomas W. Showalter 23 Sep. 1981 87 p refs
(Contract NAS2-9741)
(NASA-CR-166258) Avail: NTIS HC A05/MF A01 CSCL 14B

The vertical motion simulator (VMS) is designed to simulate a variety of experimental helicopter and STOL/VTOL aircraft as well as other kinds of aircraft with special pitch and Z axis characteristics. The VMS includes a large motion base with extensive vertical and lateral travel capabilities, a computer generated image visual system, and a high speed CDC 7600 computer system, which performs aero model calculations. Guidelines on how to measure and evaluate VMS performance were developed. A survey of simulation users was conducted to ascertain they evaluated and certified simulators for use. The results are presented. S.L.

N82-12083# National Aerospace Lab., Tokyo (Japan). Aerodynamics Div.
CONSTRUCTION AND PERFORMANCE OF NAL TWO-DIMENSIONAL TRANSONIC WIND TUNNEL
1980 104 p refs In JAPANESE; ENGLISH summary
(NAL-TR-647; ISSN-0389-4010) Avail: NTIS HC A06/MF A01

The construction and the results of initial calibration are described. This tunnel was built to meet the requirements of high Reynolds number testing of wing sections at transonic regime. It is a blowdown tunnel with a test section of 0.3m x 1.0m. The required capability of this wind tunnel is for Mach numbers ranging from 0.2 to 1.2 and for a Reynolds number up to 40 million at Mach number 0.8 with sufficient running time. An outline of the design objectives is given. The completed facilities, i.e., the wind tunnel, the instrumentation and operation system, the silencer and auxiliary equipment of the air compressor and the air reservoir, are described in detail. The performance of the tunnel when it is empty is described, and the results of a few experiments with an airfoil model of the NACA 64A410 are presented. High Reynolds number testing can be achieved in this wind tunnel without any trouble. S.W.

N82-12085*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A LOOK INSIDE THE LANGLEY 16-FOOT TRANSONIC TUNNEL: USER'S GUIDE
Kathryn H. Peddrew, comp. Aug. 1981 157 p refs
(NASA-TM-83186) Avail: NTIS HC A08/MF A01 CSCL 14B

The 16-foot transonic tunnel is a single-return atmospheric wind tunnel having a slotted test section. The primary emphasis for research in this facility is the integration of the propulsion system into advanced aircraft concepts. The large test section size, 15.5 feet in diameter lends itself to conducting research in this area, where large models are required in order to provide adequate definition of the model geometry associated with the integration of the propulsion system. The nominal test Mach number range for this facility varies from 0.20 to 1.3. Topics covered include (1) facility description; (2) model installation equipment for aerodynamics; (3) model support system for propulsion simulation testing; (4) propulsion simulation systems; (5) calibrating propulsion simulation systems; (6) instrumentation; (7) data acquisition; (8) model design criteria; and (9) wind tunnel test planning. A.R.H.

N82-12143*# Boeing Commercial Airplane Co., Seattle, Wash.
IN-SERVICE INSPECTION METHODS FOR GRAPHITE-EPOXY STRUCTURES ON COMMERCIAL TRANSPORT AIRCRAFT Final Report
M. L. Phelps Nov. 1981 106 p refs
(Contract NAS1-15304)
(NASA-CR-165746) Avail: NTIS HC A06/MF A01 CSCL 11D

In-service inspection methods for graphite-epoxy composite structures on commercial transport aircraft are determined. Graphite/epoxy structures, service incurred defects, current inspection practices and concerns of the airline and manufacturers, and other related information were determined by survey. Based on this information, applicable inspection nondestructive inspection methods are evaluated and inspection techniques determined. Technology is developed primarily in eddy current inspection. S.L.

N82-12145# McDonnell Aircraft Co., St. Louis, Mo.
EFFECT OF FIGHTER ATTACK SPECTRUM ON COMPOSITE FATIGUE LIFE Final Report, Sep. 1979 - Oct. 1980
R. Badaliance and H. D. Dill Mar. 1981 119 p refs

(Contract F33615-78-C-3218; AF Proj. 2401)
(AD-A105034; AFWAL-TR-81-3001) Avail: NTIS HC A07/MF A01 CSCL 11/4

The objective was to evaluate the effect of fighter wing load spectrum variations on the life behavior of composite structures. Six types of spectra were generated: (a) clipping to 90% test limit stress, (b) addition of stress overloads, (c) addition of low loads, (d) truncation to 70% test limit stress, (e) clipping of tension loads, (f) increased severity and number of air-to-air loads. A single hole compression test specimen was designed to simulate fatigue critical areas of fighter wing skins. GRA

N82-12169*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE EXTINGUISHANT MATERIALS Patent Application
Robert L. Altman, Ludwig A. Mayer (San Jose State Univ.), and Alan C. Ling, inventors (to NASA) (San Jose State Univ.) Filed 3 Nov. 1981 11 p
(NASA-Case-ARC-11252-1; US-Patent-Appl-SN-317977) Avail: NTIS HC A02/MF A01 CSCL 21B

Fire extinguishant materials were developed for extinguishing fires on hot metal surfaces caused by liquid fuels such as jet engine fuels. The composition of the materials is a mixture of a finely divided aluminum compound and alkali metal, stannous or plumbous halide. The aluminum compound may be aluminum hydroxide, alumina or boehmite, but preferably it is an alkali metal dawsonite. The metal halide may be an alkali metal, e.g. potassium iodide, bromide, or chloride, or stannous or plumbous iodide, bormide, or chloride. Potassium iodide is preferred. The presence of the halide improves the performance of the aluminum compound in extinguishing fires on hot metal surfaces. NASA

N82-12178# Atlantic Research Corp., Alexandria, Va. Combustion and Physical Science Dept.
CHEMISTRY OF COMBUSTION OF FUEL-WATER MIXTURES Final Technical Report, 1 Jun. 1980 - 31 May 1981
Edward G. Skolnik, Edward T. McHale, and Harley L. Heaton Sep. 1981 51 p refs
(Contract N00014-80-C-0534)
(AD-A105401) Avail: NTIS HC A04/MF A01 CSCL 21/2

The continuation of an experimental flame study concerning the nonphysical processes that lead to soot suppression when water is added to fuel, begun in a previous program is reported. The study included a mapping of temperature, chemical species and soot profiles of laminar diffusion flames with and without water added. Fuels studied included ethylene and a benzene/hydrogen mixture. Flames with nonreactive gases added (argon, nitrogen), were also studied for comparison purposes. The study concludes that the reduction of soot by water in an ethylene diffusion flame can be completely explained by thermal effects. The results are not as definitive for benzene. The addition of water causes a greater reduction in soot than does a thermally equivalent addition of argon, but no noticeable differences in chemical species profiles are observed. There is evidence, however, that water addition causes an increase in concentration of an oxygen-containing tarry substance present in the flame prior to soot formation. During the course of the study it was also possible to estimate both soot particle diameters (1-2 x .000001 cm at the beginning of the oxidation zone) and an activation energy for soot oxidation by the OH radical (7-8 kcal/mole). In addition, it was possible to confirm the presence of and quantify the oxygen concentration in the center of diffusion flames, first reported under the previous program. Author (GRA)

N82-12216*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PROGRESS IN PROTECTIVE COATINGS FOR AIRCRAFT GAS TURBINES: A REVIEW OF NASA SPONSORED RESEARCH
John P. Merutka 1981 29 p refs Presented at the 5th Ann. Conf. on Composite and Adv. Mater., Merritt Island, Fla., 19-22 Jan. 1981; sponsored by the Am. Ceramic Soc., Inc.
(NASA-TM-82740; E-711) Avail: NTIS HC A03/MF A01 CSCL 11F

Problems associated with protective coatings for advanced aircraft gas turbines are reviewed. Metallic coatings for preventing titanium fires in compressors are identified. Coatings for turbine section are also considered. Ductile aluminide coatings for protecting internal turbine-blade cooling passage surface are also identified. Composite modified external overlay MCrAlY coatings deposited by low-pressure plasma spraying are found to be better in surface protection capability than vapor deposited MCrAlY coatings. Thermal barrier coating (TBC), studies are presented. The design of a turbine airfoil is integrated with a TBC, and computer-aided manufacturing technology is applied. S.L.

N82-12230* International Harvester Co., San Diego, Calif.
FORMULATION AND CHARACTERIZATION OF POLYIMIDE RESILIENT FOAMS OF VARIOUS DENSITIES FOR AIRCRAFT SEATING APPLICATIONS Final Report, 18 Feb. 1980 - 30 Sep. 1981
J. Gagliani, R. Lee, and U. A. K. Sorathia 30 Sep. 1981 151 p refs
(Contract NAS9-16009)
(NASA-CR-167421; CSR81-R-4834-20) Avail: NTIS HC A08/MF A01 CSCL 11G

Light weight, heat and fire resistant low smoke generating polyimide foams are developed for aircraft seating applications. The material is upgraded and classified into groups for fabrication of cushions possessing acceptable comfort properties. Refinement and selection of foaming processes using a variety of previously developd foaming techniques and definition of property relationships to arrive at the selection and classification of polyimide foams into five groups in accordance with predetermined ILD values are emphasized. S.L.

N82-12249# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Mechanical Engineering.
DETERMINATION AND ANALYSIS OF JET AND MISSILE FUEL DEPOSITS Final Report
James L. Lauer 14 Aug. 1981 32 p
(Contract N00164-79-M-2522)
(AD-A105458; NWSC/CR-RDTR-151) Avail: NTIS HC A03/MF A01 CSCL 21/4

Jet fuel deposits, some of them supplied on their original support by Dr. Hazlett of the Naval Research Laboratory, were examined by attenuated total reflection spectroscopy and by infrared Fourier transform emission spectroscopy for the purpose of finding a procedure suitable for in situ analysis. The infrared radiation emitted by samples at 50-65 C was adequate for qualitative analysis, which can readily be made quantitative by further work. Definite sharp peaks corresponding to aromatic materials were found. Author (GRA)

N82-12256# Brookhaven National Lab., Upton, N. Y. Catalyst Group.
DEVELOPMENT OF CATALYTIC SYSTEMS FOR THE CONVERSION OF SYNGAS TO JET FUEL AND DIESEL FUEL AND HIGHER ALCOHOLS Annual Report
William A. Slegeir Oct. 1980 18 p
(Contract DE-AC02-76CH-00016)
(DE82-000087; BNL-51423) Avail: NTIS HC A02/MF A01

A highly active series of Fischer-Tropsch catalysts are developed on the basis of insights provided by the oxide theory. The method of catalyst formulation is unique in Fischer-Tropsch chemistry, yet is simple and reproducible. These catalysts are superior to ordinary catalysts for hydrocarbon synthesis with regard to rate, operating conditions, and, product selectivity and longevity. The products of these catalysts are ideally suited for use as diesel and jet fuels. Once formed, the catalysts display remarkable stability toward air. Oxide interactions, the role of promoters, and the synergistic behavior of bimetallic catalysts systems are studied. Bimetallic systems for hydrocarbon and alcohol synthesis are discussed. DOE

N82-12303# Federal Aviation Administration, Atlantic City, N.J.
MOVING TARGET DETECTOR/AIRPORT SURVEILLANCE RADAR (ASR-7) FIELD EVALUATION Final Report, Feb. 1979 - Jan. 1980
W. Goodchild Aug. 1981 52 p refs
(AD-A105196; FAA-CT-81-31; FAA-RD-81-57) Avail: NTIS HC A04/MF A01 CSCL 17/7

The Moving Target Detector (MTD) II, a sophisticated radar processor, was evaluated to determine its capability to provide improved radar detection in an air traffic control (ATC) environment. The MTD II was installed on one channel of an airport surveillance radar (ASR-7) at Burlington, Vermont. The major objective of testing was to compare the performance of the MTD II with that of the ASR-7 Moving Target Indicator (MTI). This report concentrates on the comparative probability of detection, false alarm rate, MTI improvement factor, subclutter visibility, dynamic range, velocity response, and the simultaneous flight test results of the two systems. Comparison of the MTD II to the MTD I system is made when necessary to show major improvements or deficiencies in the MTD II design. The results of the tests have shown that the MTD II provides surveillance capabilities superior to those of the ASR-7/MTI. Author (GRA)

N82-12304# Federal Aviation Administration, Atlantic City, N.J.
COLUMBUS, OHIO, VOICE RESPONSE SYSTEM DEMONSTRATION AND EVALUATION Final Report, Dec. 1979 - Apr. 1980
John C. Henline Jun. 1981 54 p
(FAA Proj. 131-402-854)
(AD-A104750; FAA-CT-80-50; FAA-RD-81-20) Avail: NTIS HC A04/MF A01 CSCL 17/2

The Voice Response System (VRS) was subjected to a 4-month demonstration in the Columbus, Ohio, Flight Service Station (FSS) preflight area. The purpose of the experiment was to test and evaluate the VRS system, user acceptance, and the effects on the specialists/facility workload, and to determine the general impact of VRS on the Columbus (CMH) FSS preflight area. In addition, the test permitted collection of technical performance data which could serve as the framework for an integrated national system for the mass dissemination of weather information. It is concluded that the VRS caused a shift in user demand/preference, reduced FSS briefer workload, reduced demand for basic pilots automatic telephone weather answering service (PATWAS), and was determined to be acceptable to the general aviation user. Author (GRA)

N82-12382# ARO, Inc., Arnold Air Force Station, Tenn.
AN INVESTIGATION OF F-16 NOZZLE-AFTERBODY FORCES AT TRANSONIC MACH NUMBERS WITH EMPHASIS ON MODEL SCALE EFFECTS Final Report, Oct. 1979 - Sep. 1980
Earl A. Price, Jr. Sep. 1981 140 p refs
(AD-A104905; AEDC-TR-80-57; AFWAL-TR-81-2110) Avail: NTIS HC A07/MF A01 CSCL 20/4

An experimental program was conducted to provide nozzle-afterbody data with a minimum interference support system on a 0.25-scale F-16 model and to determine the interference induced on then nozzle-afterbody region by sting and strut model support systems. Data obtained on the 0.25-scale model are compared with data from a 0.11-scale model for evaluation of model scale effects. The investigation was conducted over the Mach number range from 0.6 to 1.5. Data are presented in terms of coefficients and increments in coefficients of nozzle-afterbody axial and normal forces obtained from integrating pressure data. High-pressure air at ambient temperature was utilized for exhaust plume simulation. The results indicate close agreement in axial-force coefficient between configurations having full and annular nozzles at design pressure ratio. Very little effect of Reynolds number was found on the nozzle-afterbody axial force. Wave interference adversely affected axial-force data from the 0.25-scale model at Mach numbers between 1.0 and 1.1, producing lower axial force on the model afterbody. Large differences were determined in both the magnitude and the sign of strut interference from the two model installations. Author (GRA)

N82-12446# Naval Ocean Systems Center, San Diego, Calif.
PORTABLE AIR DRIVEN VARIABLE SPEED FIBER OPTIC CABLE TERMINATION POLISHER Technical Report, Mar. 1979 - Aug. 1980
A. Flores 15 Mar. 1981 46 p refs
(AD-A104797; NOSC/TR-708) Avail: NTIS HC A03/MF A01 CSCL 13/8

Manufacturing processes and techniques were developed to produce in larger volume a portable air driven variable speed fiber optic cable polisher with the necessary characteristics to perform in the operational environments encountered during installation and maintenance of fiber optic cables in military aircraft. Author (GRA)

N82-12448# Joint Publications Research Service, Arlington, Va.
GERMAN-ARGENTINE EXPERIMENT: VERTICAL-ROTOR WIND ENGINE
Peter Raabe *In its* W. Europe Rept.: Sci. and Technol., No. 73 (JPRS-78976) 1 Sep. 1981 p 18-19 Transl. into ENGLISH from Tagesspiegel (Berlin), 4 Jul. 1981 p 12

Avail: NTIS HC A03/MF A01

Designed by aerodynamicists, a wind engine built in Patagonia is independent of the direction of the wind due to its vertical rotating axis. The narrow rotor blades have optimum aerodynamic efficiency. Drum-like wind collectors at the top and bottom of the rotating axis serve as starters. The plant incorporates simple instead of sophisticated mechanical parts, and its maintenance requirements are extremely low. Only the two rotating bearings located at the top and bottom of the axis require lubrication, with the oil being changed only twice a year. A.R.H.

N82-12[illegible]# Systems Control, Inc., West Palm Beach, Fla. Technology Industries Div.
ANALYSIS OF INTEGRATED FUEL-EFFICIENT, LOW-NOISE PROCEDURES IN TERMINAL-AREA OPERATIONS
J. S. McKinley Jan. 1981 125 p refs
(Contract DE-AC01-80CS-50141)
(DE81-029833; DOE/CS-50141/T1) Avail: NTIS HC A06/MF A01

The specific aviation energy conservation issue, terminal area fuel conservation and airport noise level relationships, are investigated. The potential fuel savings and noise level reduction in the Los Angeles International (LAX) terminal area between 1980 and 1990 attributable to compliance with the noise requirements of FAR Part 36 were quantified. These savings are due to the retiring, retrofitting and re-engining of older narrow-body aircraft (DC-8, B707, etc.) and the growth of wide body aircraft operations (DC-10, B747, B767, etc.). Current noise abatement procedures that could be relaxed without adversely impacting current (1980) noise levels, and at the same time conserving additional fuel. Two FAA computer models were used. The Integrated Noise Model (INM) Version 2.7, was used for noise analysis, and INMOD, a preliminary fuel burn model, for the fuel analysis. The results of this detailed analysis revealed that due to the changing aircraft mix at LAX to include more wide body aircraft and fewer narrow body aircraft operations, airport noise level will decrease by 8.5 and 3.2 square miles for the 75 Ldn contour for 1985 and 1990, respectively, from the 1980 baseline. DOE

N82-12[illegible]*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RESEARCH AND TECHNOLOGY Annual Report
Nov. 1981 88 p
(NASA-TM-83221) Avail: NTIS HC A04/MF A01 CSCL 05B

Langley Research Center is engaged in the basic an applied research necessary for the advancement of aeronautics and space flight, generating advanced concepts for the accomplishment of related national goals, and providing research advice, technological support, and assistance to other NASA installations, other government agencies, and industry. Highlights of major accomplishments and applications are presented. [illegible]

N82-13045# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE IMPACT OF NEW GUIDANCE AND CONTROL SYSTEMS ON MILITARY AIRCRAFT COCKPIT DESIGN
Aug. 1981 217 p refs In ENGLISH; partly in FRENCH Symp. held in Bad-Cannstatt, West Germany, 5-8 May 1981
(AGARD-CP-312; ISBN-92-835-0297-3) HC A10/MF A01

The requirements and technologies involved in cockpit systems were reviewed. Topics include: displays; controls/displays system integration; automated systems/man interface; and cockpit systems evaluation. Emphasis is placed on the design of a cockpit layout with controls and displays that maximize the overall aircraft capability while keeping the pilot's workload within bounds by the use of more automation of system management. For individual titles, see N82-13046 through N82-13064.

N82-13046# Textron Bell Helicopter, Fort Worth, Tex. Human Factors and Cockpit Arrangement Group.
HOW THE HELICOPTER COCKPIT BENEFITS FROM DIGITAL AVIONICS
John H. Emery *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 13 p ref
Avail: NTIS HC A10/MF A01

An overview of the operations in helicopter cockpit design made possible through the application of advanced digital technology to cockpit displays and controls is presented. This technology enables the pilot to have more information available while at the same time reducing his workload and providing for substantially improved cockpit management. One of the major research programs through which this technology was tailored for military helicopters is ADAS (Army Digital Avionics System). This program is discussed, along with Bell helicopter cockpit designs. T.M.

N82-13050# Smiths Industries Ltd., Bishops Cleeve (England). Aerospace and Defense Systems.

ELECTRONIC FLIGHT DECK DISPLAYS FOR MILITARY TRANSPORT AIRCRAFT

R. A. Chorley *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 12 p refs

Avail: NTIS HC A10/MF A01

These display systems offer operational and economic advantages which can be realized in military as well as in civil aircraft. In particular, the flexibility of the display formats which can be provided, and the ease with which the information content can be changed, enable all the information required for the control of a transport aircraft to be displayed on the main panel, and go a long way towards making operation by a two-man crew possible. In addition, the flexibility of an electronic display system makes it feasible to minimize the effect of failures within the display system to an extent which is impossible in the case of conventional instruments. Full realization of this capability, which calls for careful selection of the system architecture to be employed, may lead to a significant in mission success. A discussion of CRT displays is presented. T.M.

N82-13051# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Directorate of Avionics Engineering.

COLOR CRT DISPLAYS FOR THE COCKPIT

Harry L. Waruszewski *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 22 p refs

Avail: NTIS HC A10/MF A01

Color displays are currently being proposed for installation or are being installed in civilian and military aircraft cockpits. The complexity of designing a good color display is much greater than that of a monochromatic display. The human factors data and cockpit requirements needed to develop color cockpit displays so that requirements for a usable display can be generated are discussed. The color display technology was evaluated with respect to satisfying the established human factors requirements. Test methodologies need to be developed to determine compliance of the color displays to the specification requirement. Finally, the need for displays to be integrated into the cockpit using total cockpit human factors criteria to maximize the possible workload reduction and safety of the aircraft is discussed. T.M.

N82-13052# Thomson-CSF, Paris (France).

HEAD UP DISPLAYS

Claude Maureau *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 7 p

Avail: NTIS HC A10/MF A01

The displays present information to pilots without depriving them of a simultaneous external view. This implies that head-up dispdisplays are collimated displays. The problems involved with collimation are discussed and the possibility of head-up providing pilots with directional information is considered. T.M.

N82-13053# Army Avionics Research and Development Activity, Fort Monmouth, N. J.

INTEGRATION OF CONTROLS AND DISPLAYS IN US ARMY HELICOPTER COCKPITS

J. A. Dasaro and C. T. Elliott *In* AGARD The Impacts of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 19 p refs

Avail: NTIS HC A10/MF A01

Expanded missions such as anti-armor, night surveillance, and air-to-air, coupled with the survivability requirement of nap-of-the-Earth flight, dictate the approach to cockpit design. This approach must apply the latest technological innovations in the areas of controls, displays multiplexing, and microprocessors to unburden the pilot. Space, weight, and cost constraints placed on the cockpit system designers must also be satisfied. The U.S. Army completed a full scale engineering development program in the area of cockpit integration, and is currently involved in a more ambitious exploratory development effort. An overview of these efforts to integrate the helicopter cockpit, including results of simulation experiments and operational flight tests, is presented. T.M.

N82-13054# Collins Radio Co., Cedar Rapids, Iowa. Government Avionics Div.

A STANDARD CONTROL DISPLAY UNIT FOR MULTI-AIRCRAFT APPLICATION

Ronald L. Swenson and Craig R. Scougton *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 10 p

Avail: NTIS HC A10/MF A01

The need for standardization of military hardware is well documented both within the US DOD and NATO. Standardization issues revolve mainly around interoperability, logistics, and life-cycle cost advantages. The issue of standardization and its suitability in the design of aircraft control/display units (CDU) is addressed. Potential benefits, requirements, and remaining problems associated with standardization of avionics control displays are discussed. Included is a discussion of a CDU that is currently being produced which has many of the features considered essential to the ultimate standard CDU. T.M.

N82-13058# Crouzet Aerospace and Systems, Valence (France).

USING VOICE CONTROL ONBOARD COMBAT AIRCRAFT [UTILISATION DE LA COMMANDE VOCALE A BORD DES AERONEFS DE COMBAT]

J. R. Coster and J. M. Melocco *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpits Design Aug. 1981 5 p In FRENCH

Avail: NTIS HC A10/MF A01

The use of the voice would be a valuable tool in resolving problems associated with pilot workload, in reducing the surface of the flight instrument system and the complexity of the man machine interface in high performance combat aircraft. A program established at the Laboratory of information for Mechanics and Engineering Sciences validates in aircraft environments the methods of speech recognition and synthesis developed in research laboratories. It is merely a matter of the universal recognition, at the acoustic level of isolated words pronounced by a single speaker. The techniques used are described. These include laboratory experiments involving an aeronautical dialog in a noisy environment and experimentation with a simulator of a vocal dialog applied to an aircraft with modern weapons and to the study of human factors. Experimentation also takes place in a flight simulator. Transl. by A.R.H.

N82-13060# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugfuehrung.

EXPERIMENTAL INVESTIGATION OF A HELMET MOUNTED SIGHT/DISPLAY FOR HELICOPTER

R. Beyer, E. Dannaberg, E. Kohnen, and H. Stein *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 11 p

Avail: NTIS HC A10/MF A01

A helmet mounted sight/display (HMS/D) combined with an infrared camera and electronic instrument displays was investigated as a guidance aid for the low level flight of helicopters at night. The static and dynamic accuracy of the tracking mechanism which aligns the lines of sight of both the pilot and the camera was determined by means of a target and motion simulator. System performance was checked with a Bo 105 helicopter in low level flight at night. From the results obtained the importance of the HMS/D as an guidance aid becomes evident relative to other night vision/display systems. Author

N82-13061# Royal Aircraft Establishment, Farnborough (England). Flight Systems Dept.

USE OF A HELMET-MOUNTED MATRIX DISPLAY FOR PRESENTING ENERGY-MANEUVERABILITY INFORMATION DURING SIMULATED CLOSE COMBAT

D. N. Jarrett *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 10 p refs

Avail: NTIS HC A10/MF A01

Since continuous visual contact display (HMMD) with the

enemy is essential in close combat the provision of this information on a helmet-mounted display (HMMD) may be particularly useful. However, the (in) visibility of the image against a bright sky background, the increased helmet weight and other inconveniencing counter effects when coupled with the high attentional and physical demands of combat, may obviate any advantages of controlling the aircraft using the extra information. A series of exercises was set up to assess the HMMD in this application. The device was the subject of a flight trial in a light jet aircraft, and two studies were completed in the newly-commissioned RAE air combat simulator. These studies enabled pilots to become familiar with the device and the unusual display format, in order to assess their combined usefulness in a combat context.
A.R.H.

N82-13063# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

TANKER AVIONICS AND AIRCREW COMPLEMENT EVALUATION

Richard W. Moss and Gregory J. Barbato (Bunker-Ramo Corp., Dayton, Ohio) *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 18 p refs

Avail: NTIS HC A10/MF A01

A four phase effort addressing the control and display design issues associated with operating the SAC'S KC-135 tanker without the navigator crew position is discussed. Topics covered include the mission analysis phase during which the tanker's operational responsibilities were defined and documented; the design phase durng which alternative crew station design concepts were developed; the mockup evaluation phase which accomplished initial SAC crewmember assessment of cockpit designs; and the simulation phase which validated the usability of the crew system redesign. A recommended crew station configuration is examined and some of the philosophy underlying the selection of cockpit hardware and systems is discussed. A.R.H.

N82-13064# McDonnell Aircraft Co., St. Louis, Mo.

F/A 18 HORNET CREW STATION

Eugene C. Adam *In* AGARD The Impact of New Guidance and Control Systems on Mil. Aircraft Cockpit Design Aug. 1981 6 p

Avail: NTIS HC A10/MF A01

The Hornet crew station design requirement was to essentially provide the capability contained in both the F-4 and A-7 weapon systems so as to perform both the fighter attack roles, make it operable by one pilot, and increase mission reliability by a combination of improved hardware reliability and functional redundancy. To put this requirement in perspective, the F/A-18 cockpit has 40% less usable area than any of its contemporaries. This area constraint necessitated extensive integration of the weapon system controls and displays. The resultant crew station features four multipurpose cathoderay displays driven by two mission computers, an integrated upfront control panel, and numerous automatic functions on the stick and throttle. The rationale leading up to the configuration is described and a few examples of the one-man-operability features of the Hornet and how they would used by the pilot are presented. A.R.H.

N82-13065# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

AERODYNAMICS OF POWER PLANT INSTALLATION

Sep. 1981 510 p refs In ENGLISH and FRENCH Proc. of conf. held in Toulouse, 11-14 May 1981

(AGARD-CP-301; ISBN-92-835-0301-8) Avail: NTIS HC A22/MF A01

The aerodynamic problems in power plant installation are surveyed and computational and design methodologies are presented. Combat aircraft intakes, afterbodies and nozzles, testing and analysis techniques, and installation aerodynamics of transport aircraft are addressed. For individual titles, see N82-13066 through N82-13098.

N82-13066# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

PERFORMANCE OF HIGHLY INTEGRATED INLETS FOR SUPERSONIC AIRCRAFT

Lewis Surber, Jan Syberg and Joseph Koncsek *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 12 p refs Prepared in cooperation with Boeing Military Airplane Co., Seattle

Avail: NTIS HC A22/MF A01

Performance data obtained on several subsonic diffusers applicable to advanced supersonic tactical aircraft configurations were used to select a forebody-inlet model for proof-of-concept wind tunnel performance evaluation. Three of the diffusers were designed for high aspect ratio inlets having throat aspect ratios greater than seven. A fourth design incorporated a low aspect ratio inlet. Two of the high aspect ratio diffusers and the low aspect ratio diffuser incorporated duct bends typical of inlets substantially offset from the engine centerline. Preliminary tests of the high aspect of ratio diffuser produced high total pressure recovery coupled with relatively low flow distortion. Furthermore, the use of longitudinal vanes in one high aspect ratio diffuser provided reductions in engine face flow distortion with very little performance degradation. Proof-of-concept tests further investigated the performance of a high aspect ratio, side-mounted external compression supersonic inlet. Tests were performed in a 16-foot supersonic propulsion wind tunnel at Mach numbers of 1.6 to 2.2 over a -6 to 12 deg angle of attack range and sideslip angles from -8 to +8 deg. The results of these tests support the use of high aspect ratio inlets with sharp duct bends as a viable design option in future supersonic aircraft designs.
M.G.

N82-13067# Royal Aircraft Establishment, Bedford (England). Aerodynamics Dept.

SOME RAE RESEARCH ON SHIELDED AND UNSHIELDED FUSELAGE MOUNTED AIR INTAKES AT SUBSONIC AND SUPERSONIC SPEEDS

J. A. Ross, I. McGregor, and A. J. Priest *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 16 p refs

Avail: NTIS HC A22/MF A01

The incidence performance of fuselage-mounted intakes at subsonic and supersonic speeds is examined. The effects of simple changes in intake geometry, such as increasing contraction ratio and altering lower lip shape, are first considered; it is shown that such modifications can be beneficial at subsonic speeds, but drag penalties tend to limit their use at higher Mach numbers. Two intake locations that potentially offer a good degree of incidence shielding - underfuselage and underwing - are then examined. It is concluded that satisfactory performance can be obtained with an underwing installation, but a detailed study of strake shape, plan, splitter plates and boundary layer diversion must be made if the combination is to be successful over the whole of the intended flight envelope. However, for the configurations tested, the underfuselage location offers generally better intake performance lower technical risk. Finally, some results for a side-mounted staggered lip intake are presented, together with some two dimensional calculations of the mutual interference effects that occur between the upper and lower lips. It is suggested that an intake of this type can be competitive with an underfuselage installation. M.G.

N82-13068# National Gas Turbine Establishment, Pyestock (England).

PREDICTION AND MEASUREMENT OF TIME-VARIANT, THREE-DIMENSIONAL FLOWS IN MILITARY AIRCRAFT INTAKES

D. E. Colbourne and J. E. [illegible] *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 16 p refs

Avail: NTIS HC A22/MF A01

The development of a computational method suitable for predicting the three dimensional flows within the diffuser sections of aircraft intakes is described. A fast method for automatic grid generation, applicable to ducts of any smoothly varying cross-sectional shape, is discussed. The development of a finite-volume, time-marching method for solving the flow equations is also described. The validity of the chosen techniques is discussed in the light of comparisons with analytical and empirical results. Empirical techniques were developed to examine flows in which viscous or time variant effects are dominant. A rotating yaw meter rake was developed to accurately [illegible] detailed flow surveys at the exit of model diffusers, and results may be obtained from these both in isolation and in the presence of a compressor. The development of instrumentation and data processing facilities for measuring instantaneous engine face total pressure distortion in small scale models is also described, together with the validation of this technique by comparison with results from a full-size replica of the intake tested under [illegible] conditions. M.G.

N82-13069# British Aerospace Aircraft Group, [illegible]

EFFECTS OF INTAKE GEOMETRY ON [illegible]

INTAKE PERFORMANCE AT ZERO AND LOW FORWARD SPEEDS

A. C. Willmer, T. W. Brown, and E. L. Goldsmith (RAE, Bedford, England) *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 16 p refs Sponsored in part by Ministry of Defence
Avail: NTIS HC A22/MF A01

A series of experiments on circular cross-section pitot intakes at Mach numbers from 0 to 0.21 and angles of incidence and sideslip from 0 to 40 deg are presented. Measurements were made at the engine face of 72 pitot pressures, 4 unsteady pitot pressures, swirl angle at six positions, and boundary layer profiles at four positions. Static pressure distribution around the cowl lips and along the diffusers were also measured. Five cowl lips covering a range of contraction ratios and lip shapes were tested with both a straight and an S bend diffuser. The effect of inserting parallel section spacers between the cowl lip and the front of the subsonic diffuser and between the end of the subsonic diffuser and the engine face instrumentation and the effect of a thin lip slot upstream of the intake throat were evaluated. Results indicate that, lip losses may be decreased by increasing contraction ratio, fitting a lip slot or a forward spacer. Steady state flow distortion at the engine face is decreased by increasing lip contraction ratio or by fitting an aft extension. For the S duct tested, distortion levels are set by the diffuser as much as by incidence. Sideslip, however, lessens the distortions. M.G.

N82-13071# Institut de Mecanique des Fluides de Lille (France).

TRANSONIC FLOWS IN AN AIR INLET WITH LARGE INCIDENCE AND THE EFFECT OF A BLOWING TRAP [ECOULEMENTS TRANSSONIQUES DANS UNE PRISE D'AIR EN GRANDE INCIDENCE AT EFFET DE TRAPPE DE SOUFFLAGE]

A. Dyment, P. Gryson, and J. P. Flodrops *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 13 p ref In FRENCH

Avail: NTIS HC A22/MF A01

Flow in a bidimensional air intake with large incidence was studied under conditions in which the upstream flow was subsonic and the internal flow could be regulated. The phenomena following flow separation were examined, especially the homogenization of the internal flow. A device for improving mogenization which involves a natural deflection accomplished by a scoop designed to guide the captivated air was tested. The universal aspect of internal flow was studied using probes in different sections. The unsteady phenomena were analyzed from ultra high speed visualizations and the mean flow was characterized from classic visualization. The insertion of the deflector appreciably improved the performance of the air intake. The coefficient of output (sigma) and the total mean pressure (P sub tm) were considerably improved at the level of the compressor. While the use of the scoop to guide the air towards the slot had only a weak influence on sigma and P sub tm at the compressor level, it brought an appreciable gain in the speed of homogenization of the internal flow. Transl. by A.R.H.

N82-13073# Aeritalia S.p.A., Torino (Italy). Combat Aircraft Group.

SUBSONIC MILITARY AIRCRAFT ENGINE INTAKE: AN INTEGRATED THEORETICAL EXPERIMENT DESIGN

G. Bertolone and L. Fornasier *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 17 p refs

Avail: NTIS HC A22/MF A01

Two numerical codes were developed for the simulation of the engine intake-induced flow field in two dimensional transonic and three dimensional subsonic cases. Both codes were obtained by modification of existing codes suitable for the computation of the exterior flow past airfoils (by a finite element method) and about three dimensional arbitrary configurations (by a panel method). Computed results and comparison with experimental data pertinent to the analysis of a single bifurcated intake proved usefulness of the present numerical schemes for engineering applications. Engine face auxiliary doors design and side intakes diverter shape optimization was studied. Following an extensive testing program performed on a static model, the engine face auxiliary doors with annular air admission into the primary long type duct appeared to be a good alternative to the classical solution placed at the main inlet entry. Diverter geometry influence both on aerodynamics, in terms of drag coefficient, and intake performance, in terms of distortion coefficient, was investigated by testing a low speed model. R.J.F.

N82-13074# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Unternehmensbereich Flugzeuge.

THE DESIGN AND DEVELOPMENT OF THE TORNADO ENGINE AIR INTAKE

C. P. Stocks (British Aerospace, Warton, England) and H. C. Bissinger *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 21 p refs
Avail: NTIS HC A22/MF A01

The design and development of the Tornado aircraft supersonic intake is described. Critical aerodynamic design areas are outlined with special emphasis on compatibility. The intakes were designed to satisfy the conflicting requirements of greater than Mach 2 operation and a very wide incidence operating envelope at subsonic speeds. The problem of design loads is reviewed as well as the theory and operation of the automatic control system. Propulsion system behavior in flight and some examples of intake-airframe interaction are described. R.J.F.

N82-13075# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

INTEGRATION OF ADVANCED EXHAUST NOZZLES

Douglas L. Bowers and James A. Laughrey *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 14 p refs

Avail: NTIS HC A22/MF A01

Attributes of both axisymmetric and nonaxisymmetric advanced nozzles and their incorporation into an aircraft to improve cruise performance, maneuverability and short takeoff and landing operation are discussed. It was concluded that when used as a trimming device, advanced exhaust nozzles with thrust vectoring can provide significant aircraft cruise drag reduction. The aftbody/nozzle installation for advanced airframes and exhaust nozzles must be approached very carefully to demonstrate an installed drag benefit. For maneuver, advanced thrust vectoring exhaust nozzles show advantages at high angle of attack. Improved turn rate and instantaneous maneuver performance can be provided by utilizing these advanced exhaust nozzles in advanced aircraft. For short takeoff and landing aircraft advanced exhaust nozzles with both thrust vectoring and thrust reversing may be necessary. Thrust vectoring up to 60 degrees (or higher) and a propulsive lift control system may be required. R.J.F.

N82-13076# Rolls-Royce Ltd., Bristol (England). Installation Aerodynamics Group.

THE SUBSONIC PERFORMANCE OF PRACTICAL MILITARY VARIABLE AREA CONVERGENT NOZZLES

L. R. Harper IN AGARD Aerodyn. of Power Plant Installation Sep. 1981 11 p refs

Avail: NTIS HC A22/MF A01

Performance considerations involved in the selection of a variable area nozzle for reheated engines for combat aircraft are discussed. The main emphasis is on dry operation at subsonic speeds since drag, weight, leakage and other penalties in this regime can prevent an aircraft attaining its design radius of action. Zero-base nozzles are compared with a moving shroud nozzle which has a substantial annular base area in dry setting. The moving shroud nozzle, as used on the RB199 engine in the Tornado MRCA, is very competitive with zero base nozzles in terms of overall performance. It is light, mechanically simple, reliable, and its short length permits a target type thrust reverser to be used. It is concluded that this type of nozzle is the optimum choice for combat aircraft until further technology advances permit substantial improvements in the overall performace of the more sophisticated nozzles. R.J.F.

N82-13077# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).

COMPARISON OF DIFFERENT NOZZLE CONCEPTS FOR A REHEATED TURBOFAN

H. Grieb, R. Vedova, H. Enderle, and H. Nagel *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 15 p refs Sponsored in part by German Ministry of Defence

Avail: NTIS HC A22/MF A01

Several concepts of convergent and convergent/divergent nozzles are investigated and compared in view of performance, weight, complexity and the influence on afterbody drag of combat aircraft. The influence of different nozzle cooling concepts on thrust, with subsequent cooling air requirements, is investigated. The optimum ratio of exit area/throat area of convergent/divergent nozzles dependent on nozzle concept and nozzle pressure ratio is identified. The performance comparison shows that fully variable convergent/divergent nozzles promise some advantages against the simple convergent nozzle at high nozzle pressure ratios. However, the higher weight and complexity of convergent/divergent nozzles lead to the conclusion that the choice of convergent/divergent nozzles for reheated turbofan engines in combat aircraft is not generally justified. J.D.H.

N82-13078# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Aero Propulsion Lab.

ADVANCED EXHAUST NOZZLE TECHNOLOGY

Ronald J. Glidewell and Robert E. Warburton (Pratt and Whitney Aircraft Group, West Palm Beach, Fla.) *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 11 p refs

Avail: NTIS HC A22/MF A01

Turbine engine exhaust nozzle technology, including nonaxisymmetric nozzles, thrust reversing, and thrust vectoring was investigated. Trade studies to determine the impact of these developments on the thrust-to-weight ratio and specific fuel consumption of an advanced high performance, augmented turbofan engine are reported. Results are presented in a manner which provides a understanding of the sources and magnitudes of differences in the basic elements of nozzle internal performance and weight as they relate to conventional axisymmetric nozzle technology. These comparisons are presented for three categories of nozzle functional capability: jet area and exit area control, thrust reversing, and thrust vectoring. J.D.H.

N82-13082# Avions Marcel Dassault-Breguet Aviation, Saint-Cloud (France).

AN ACQUISITION AND ANALYSIS SYSTEM FOR DYNAMIC TESTS OF AIR INLETS [SYSTEME D'ACQUISITION ET D'ANALYSE POUR ESSAIS DYNAMIQUES D'ENTREES D'AIR]

Pierre Perrier, Bertrand Delahaye (SNECMA, Moissy Cramayel, France), and Gerard Laruelle (ONERA, Chatillon, France) *In* AGARD Aerodyn. of Power Plant Installation Aug. 1981 14 p refs In FRENCH

Avail: NTIS HC A22/MF A01

Improving the flight domain of combat aircraft leads to operations involving a much large variation of unsteady aerodynamic characteristics at the engine inlet than in the past. To determine if the augmentation will be effectively acceptable for compressors and engines of the future, sufficient knowledge of flows must be acquired. This entails measuring a sufficient number of unsteady flow characteristics; however, the number of measurements made must be limited because of cost as well as because of the possibility of instantaneous or deferred processing. This sequence of measurements takes into account necessary compromises. Cooperation is needed among the aircraft designer, the engine designer, and the research organization so that the work of each can complement that of the others, and an economy of means and a homogeneity of methods for analyzing and interpreting the results is possible. Transl. by A.R.H.

N82-13084# Fluidyne Engineering Corp., Minneapolis, Minn.

MODEL TESTING TECHNIQUES FOR MEASURING INLET DRAG

James S. Holdhusen and James L. Glessner *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 8 p refs

Avail: NTIS HC A22/MF A01

Two methods of measuring inlet drag in transonic flow are described. In the first method, a flow through nacelle is tested in a transonic wind tunnel. Capture ratio is varied by installing individual annular blockers in the nacelle. Corrections for the drag force exerted by the captured streamtube are determined from blow through tests in a static test stand. In the second method, drag is determined directly using a special rig which has a variable loss throttle. The thrust exiting the control surface is determined by a choked ASME nozzle. The advantages and disadvantages of the two methods are compared. E.A.K.

N82-13085# National Defence Headquarters, Ottawa (Ontario). Directorate of Science and Technology.

COMPRESSOR STALL INDUCING INSTALLATION EFFECTS OF AN ENGINE CONTROL PARAMETER FOR THE CF-5 AIRCRAFT

W. L. Macmillan, D. M. Rudnitski, and W. Grabe *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 17 p Prepared in cooperation with National Research Council of Canada, Ottawa

Avail: NTIS HC A22/MF A01

Compressor stall problems with CF-5 aircraft powered by two J85-CAN-15 engines were investigated. One major cause for compressor stalls as improper operation of the engines' control system under low temperature conditions was identified. It is demonstrated that this control system malfunction is the result of engine installation effects, which produce an erroneous compressor inlet temperature signal to the main fuel control unit. The degree of signal error for several flight conditions, such as level flight, high angles of attack, aircraft stalls, and [illegible] profiles are identified. It is found that temperature errors are greater at high angles of attack where severe compressor inlet distortion acts cumulatively in reducing the stall margin under this flight condition. E.A.K.

N82-13086# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

THE ROLE AND IMPLEMENTATION OF DIFFERENT NACELLE/ENGINE SIMULATION CONCEPTS FOR WIND-TUNNEL TESTING IN RESEARCH AND DEVELOPMENT WORK ON TRANSPORT AIRCRAFT

B. Ewald and R. Smyth *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 35 p refs

Avail: NTIS HC A22/MF A01

Different experimental methods and their specific roles in various stages of research and development were investigated. The main problem is the simulation and calibration of the propulsion system. Different simulation methods are: flow through nacelles, powered nacelles (blowing, turbine powered simulators (TPS), ejector powered), inlet models. The TPS represent the most advanced simulation of the high bypass ratio engine in model scale. A large part of the wind tunnel tests still have to rely upon flow through nacelles. A novel flow through nacelle with a variable plug is presented. It is shown that the combination of flow through nacelles and TPS can be efficiently used in the windtunnel investigation of propulsion system effects for transport aircraft. E.A.K.

N82-13087# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

WIND TUNNEL TESTS OF POWERED MODELS: A COMPARISON OF TWO METHODS OF SIMULATING THE JETS OF JET ENGINES [ESSAIS EN SOUFFLERIE DE MAQUETTES MOTORISEES: COMPARAISON DE DEUX METHODES DE SIMULATION DES JETS DES REACTEURS]

J. P. Becle and R. Perin (SNIAS, Toulouse) *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 18 p ref In FRENCH

Avail: NTIS HC A22/MF A01

Two methods for simulating engine jets were developed at ONERA. The so-called blowing jets were previously mounted for studying the Concorde. The second method, which uses small air breathing turbines was recently installed for Airbus family aircraft. Tests were conducted on semi-models mounted on a balance with six components traversed by the flow from the engine. An original mounting permits the same measurement means to be used for any principle of power or type of test used (fixed point or wind tunnel test). The installations, means of measurement, and methods of using the results are described. The respective advantages of each type of power simulation are considered from the viewpoints of complexity, duration, and precision of measurements obtained. Transl. by A.R.H.

N82-13088# Aircraft Research Association Ltd., Bedford (England).

WIND TUNNEL TEST AND ANALYSIS TECHNIQUES USING POWERED SIMULATORS FOR CIVIL NACELLE INSTALLATION DRAG ASSESSMENT

A. E. Harris and E. C. Carter *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 15 p refs

Avail: NTIS HC A22/MF A01

Full span and semi-span wind tunnel model tests and powered nacelle calibration techniques are discussed in the context of civil nacelle installation drag assessment and optimization. In order to achieve the accuracy required for drag analysis it is necessary to determine the installed net thrust of the powered nacelle simulator to the equivalent of at least one aircraft drag count. The engine simulator [illegible] of mass flow and thrust accounting and imposes the need for consistency of approach in the wind-on and calibration tests where thrust and mass flow coefficients must be known to 0.1% to 0.2% accuracy. This need for high confidence in the data at all stages of analysis led to a methodology in which the measured data is combined in various ways to enhance confidence in its final use. Experiences obtained in the use of a Mach simulation tank (MST) for the calibration of turbine powered simulator units are discussed. The MST is used to obtain simultaneous mass flow and thrust calibrations with representative internal nacelle conditions in the presence of a quiescent exhaust environment. Practical problems associated with the design of balance and airfeed arrangements are discussed along with the use of blown and turbine powered simulators. B.W.

N82-13089# Rolls-Royce Ltd., Derby (England).

ESTABLISHMENT OF AN EXPERIMENTAL TECHNIQUE TO PROVIDE ACCURATE MEASUREMENT OF THE INSTALLED DRAG OF CLOSE COUPLED CIVIL NACELLE/AIRFRAME CONFIGURATIONS, USING A FULL SPAN MODEL WITH TURBINE POWERED ENGINE SIMULATORS

G. Pugh and A. E. Harris (Aircraft Research Association Ltd., Bedford, England) *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 9 p refs

Avail: NTIS HC A22/MF A01

Definition and optimization of installed thrust/drag in civil nacelle installation design and development was studied. As a means of validating the calibration and thrust/drag analysis techniques bodied transport, Lockheed L1011, having high bypass ratio RB 211 turbofan engines with two alternative exhaust system designs was used. Wind tunnel model representation comprised a full span simulation with underwing mounted turbine powered engine simulators. Calibration techniques included the use of a Mach simulation tank in which concurrent mass flow and thrust calibrations were conducted in a quiescent exhaust environment. Data presented includes nacelle thrust and discharge coefficients, installed drag comparisons, and, finally, model to flight correlations. B.W.

N82-13090# National Aerospace Lab., Amsterdam (Netherlands).

EVALUATION OF AN EXPERIMENTAL TECHNIQUE TO INVESTIGATE THE EFFECTS OF THE ENGINE POSITION ON ENGINE/PYLON/WING INTERFERENCE

J. A. J. vanEngelen, B. Munniksma, and A. Elsenaar *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 13 p refs

Avail: NTIS HC A22/MF A01

A flexible experimental technique to study the effect of a variation of engine position for a range of test conditions was evaluated. In this test an underwing mounted 3/4 fancowl engine was investigated at six different positions as a free flow nacelle and as a strut mounted blown nacelle. Pressure and balance force measurements were made. Some typical aspects of the aerodynamic interference are discussed, notably the value of free flow nacelle measurements. Also a comparison of balance weighed and integrated pressure forces is presented. Results indicate that accurate simulation of the engine nozzle geometry is of prime importance for an investigation concerning engine/airframe integration. Nevertheless, tests on a free flow nacelle may still be useful for the selection of the most favourable engine position. A reasonable correlation was established between interference forces as obtained from pressure integration and balance measurements. However, the pressure forces tend to underestimate the balance forces. For a flexible pathfinder test, interference forces derived from pressure integration only appear to be very useful for the determination of trends in interference effects. B.W.

N82-13091# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

STUDIES OF AIR INLETS AT REYNOLDS NUMBERS COMPARABLE TO FLIGHT IN ONERA'S F1 AND S1MA WIND TUNNELS [ESSAIS DE PRISES D'AIR A DES NOMBRES DE REYNOLDS COMPARABLES AU VOL DANS LES SOUFFLERIES F1 ET S1MA DE L'ONERA]

J. Leynaert *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 12 p refs In FRENCH

Avail: NTIS HC A22/MF A01

The pressurization of the subsonic F1 wind tunnel at ONERA's Fauga-Mauzac Center was a benefit in wind tunnel tests of the air intakes of Airbus-type aircraft on a large scale at a Reynolds number near that of flight. The same model can thus be tested up to a Mach number near 1 in the S1MA wind tunnel at the Modane Center. Air intakes of military aircraft can likewise be studied in the two wind tunnels at high Reynolds numbers. The apparatus used, the methods of measurement, and the means of calibrating and control used to assure valid results are presented. Transl. by A.R.H.

N82-13092# British Aerospace Aircraft Group, Hertfordshire (England). Research Dept.

THE INFLUENCE OF CLOSED-COUPLED, REAR FUSELAGE MOUNTED NACELLES ON THE DESIGN OF AN ADVANCED HIGH SPEED WING

R. D. Laugher *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 17 p refs

Avail: NTIS HC A22/MF A01

The design approach aimed at integrating the effect of the nacelle into the basic wing design is described. Particular attention is drawn to the design risk associated with the modified inner wing supercritical flow development when nacelles are not represented in the transonic design calculations. Experimental test results are described which demonstrate the general success of the design technique. Finally, some results are presented from theoretical investigations in which an attempt was made to simulate the interference effect of the nacelle on the wing supercritical flowfield. A technique was developed whereby the nacelle and intake streamtube are replaced by an equivalent interfering body, which is derived from subcritical flow interference pressures. Results show that this technique provides a simple, cost effective tool for the supercritical design of a wing operating in the influence of a rear nacelle. M.D.K.

N82-13093# Royal Netherlands Aircraft Factories Fokker, Schiphol-Oost. Aerodynamics Dept.

AERODYNAMIC ASPECTS OF A HIGH BYPASS RATIO ENGINE INSTALLATION ON A FUSELAGE AFTERBODY

N. Voogt, J. vanHengst, and J. Th. v.d.Kolk (NRL) *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 10 p refs

Avail: NTIS HC A22/MF A01

The design process used in shaping rear fuselage mounted large diameter engine nacelles, pylons, and fuselage for a transport type aircraft is described. The objective was to suppress the local velocity levels and pressure gradients to avoid aerodynamic interference drag of the nacelle-pylon-fuselage combination in high speed cruise flight. Shapes of fuselage afterbody, nacelle, and stubwing were modified in a design-by-analysis process involving iterative and three dimensional singularity methods for inviscid subsonic flow. Windtunnel tests confirmed the adequacy of these methods. M.D.K.

N82-13094# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Service Aerodynamique Theorique.

A NUMERICAL METHOD FOR STUDYING NACELLE-JET-AIRFOIL INTERACTION IN INVISCID THREE-DIMENSIONAL FLOW [UNE METHODE NUMERIQUE POUR L'ETUDE DE L'INTERACTION NACELLE-JET-VOILURE EN ECOULEMENT TRIDIMENSIONEL NON VISQUEUX]

G. LeGall, J. Bousquet, and M. Yermia *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 13 p refs In FRENCH

Avail: NTIS HC A22/MF A01

The nacelle-jet-airfoil interaction is a complex three dimensional phenomena which is addressed in two simplified hypotheses: the fluid is incompressible and inviscid. Under these two hypotheses, the propulsive configuration is modeled by air intake with flow control and a propulsive jet with control of the pressure generator. A method of singularities is used which considers the sources and doublets of constant density and doublets of linear density on a flat panel. The equations which govern the problem constitute a nonlinear system which is divided into a linear part and a quadratic part. These two parts are solved iteratively by the Gauss-Seidel method and the Newton method. The free boundaries of the flow are also calculated by an iterative process which is integrated into the two preceding methods. Some practical results are proposed in two and three dimensional flow. Comparison with tests permits evaluation of the advantage of the simplified hypotheses. Transl. by A.R.H.

N82-13095# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

CALCULATION OF WING-BODY-NACELLE INTERFERENCE IN SUBSONIC AND TRANSONIC POTENTIAL FLOW

K. D. Klevenhusen, H. Jakob, and H. Struck *In* AGARD Aerodyn. in Power Plant Installation Sep. 1981 8 p refs

Avail: NTIS HC A22/MF A01

A calculation method especially for transport aircraft wing design with consideration of wing/body or engine/airframe interference was developed. A hybrid method, consisting of a combination of panel method and finite difference method, is an improvement of a well proved analogy method. The panel method is of higher order using linear source and doublet distributions. The transonic flow region is removed from the entire flow field and the panel method is used for calculating boundary values for the subsequent finite difference method. The finite difference method solves the full potential equation in streamline coordinates. E.A.K.

N82-13096*# Boeing Military Airplane Development, Seattle, Wash.

PREDICTION OF SUBSONIC AIRCRAFT FLOWS WITH JET EXHAUST INTERACTIONS

D. W. Roberts *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 12 p refs

(Contract NAS2-10100)

Avail: NTIS HC A22/MF A01 CSCL 02A

A numerical procedure to calculate the flow fields resulting from the viscous inviscid interactions that occur when a strong jet exhaust and aircraft flow field coupling exists was developed. The approach divides the interaction region into zones which are either predominantly viscous or inviscid. The flow in the inviscid zone, which surrounds most of the aircraft, is calculated using an existing potential flow code. The viscous flow zone, which encompasses the jet plume, is modeled using a parabolized Navier-Stokes code. The procedure features the coupling of the zonal solutions such that sufficient information is transferred between the zones to preserve the effects of the interactions. The zonal boundaries overlap and the boundary conditions are the information link between zones. An iteration scheme iterates the coupled analysis until convergence has been obtained. E.A.K.

N82-13097# Douglas Aircraft Co., Inc., Long Beach, Calif.

PROP-FAN INTEGRATION AT CRUISE SPEEDS

H. Robert Welge *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 14 p refs

Avail: NTIS HC A22/MF A01

The aerodynamic installation features of a highly loaded turboprop (prop fan) on an aircraft for flight at Mach 0.8 are discussed. The aerodynamic flow environment in which the prop fan must operate is shown for both wing and aft-fuselage installations using advanced surface panel methods. The effects of prop fan slipstream parameters on the drag of a supercritical wing are presented indicating that only small drag penalties occur. Drag reductions are possible by tailoring the local wing section to account for the rotor induced flow. Using these inputs, an integrated wing/nacelle is shown. E.A.K.

N82-13098*# Boeing Commercial Airplane Co., Seattle, Wash. New Product Development Dept.

AIRFRAME-PROPULSION SYSTEM AERODYNAMIC INTERFERENCE PREDICTIONS AT HIGH TRANSONIC MACH NUMBERS INCLUDING OFF-DESIGN ENGINE AIRFLOW EFFECTS

R. M. Kulfan and A. Sigalla *In* AGARD Aerodyn. of Power Plant Installation Sep. 1981 23 p refs

(Contract NAS1-14623)

Avail: NTIS HC A22/MF A01 CSCL 02A

The transonic speed regime for airplanes at conditions where inlet spillage takes place is discussed. A wind tunnel test program to evaluate aerodynamic performance penalties associated with propulsion system installation and operation at subsonic through low supersonic speeds was conducted. The accuracy of analytic methods for predicting transonic engine airframe interference effects was assessed. Study variables included Mach number, angle of attack, engine axial location, and nozzle mass flow ratio. Results include test theory comparisons of forces as well as induced pressure fields. Prediction capability of induced shock wave strength and locations is examined. It was found that large interference forces due to engine location and flow spillage occur at transonic speeds, that theory explains these effects, and that theory can predict quantitatively these effects. E.A.K.

N82-13105 Iowa Univ., Oakdale.

TURBULENT WAKE DEVELOPMENT BEHIND STREAMLINED BODIES Ph.D. Thesis

Sastry Suryanarayana Mutukula 1981 316 p

Avail: Univ. Microfilms Order No. 8123346

The developing turbulent wake behind streamlined bodies is reported. Detailed measurements of mean and turbulent flow properties are made in three different wake flows. The first is the symmetric wake of a flat plate, the second is the asymmetric wake of a flat plate, (asymmetry being produced by roughening one side of the plate) and the third is the curved wake of an asymmetric airfoil at incidence. It is possible to identify three important regions in the wake, namely the near wake, intermediate wake and the far wake. The performance of the existing turbulence models in the case of the symmetric flat plate wake is studied. The near and intermediate wake regions are predicted by a sophisticated turbulence model. Dissert. Abstr.

N82-13106*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FORCE AND MOMENT, FLOW-VISUALIZATION, AND BOUNDARY-LAYER TESTS ON A SHUTTLE ORBITER MODEL AT MACH 6

Robert L. Calloway Dec. 1981 25 p refs

(NASA-TP-1952; L-14782) Avail: NTIS HC A02/MF A01 CSCL 01A

Force and moment, flow visualization, and boundary layer state tests were conducted using two 0.004 scale shuttle orbiter models. The force and moment tests were conducted for an angle of attack range from 20 to 40 deg and for Reynolds numbers based on reference length from 0.4 million to 3.6 million. Schlieren photographs were obtained for each angle of attack and Reynolds number. The boundary layer state tests, which were conducted using hot film sensors mounted in a separate model, were conducted over the same range of conditions as the force tests. Test results were combined to show that changes in the boundary layer on a typical hypersonic force test model affect measurement of the axial force coefficient and that the state of the local boundary layer is important for interpreting hypersonic aerodynamic test results. S.L.

N82-13107*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

WIND-TUNNEL INVESTIGATION OF THE EFFECTS OF BLADE TIP GEOMETRY ON THE INTERACTION OF TORSIONAL LOADS AND PERFORMANCE FOR AN ARTICULATED HELICOPTER ROTOR

William T. Yeager and Wayne R. Mantay Dec. 1981 64 p refs Prepared in cooperation with Army Aviation Research and Development Command, Hampton, Va.

(DA Proj. 1L2-62209-AH-76)

(NASA-TP-1926; AVRADCOM-TR-81-B-5; L-14674) Avail: NTIS HC A04/MF A01 CSCL 01A

The Langley transonic dynamics tunnel was used to determine the degree of correlation between rotor performance and the dynamic twist generated by changes in blade tip geometry using an articulated rotor with four different tip geometries at advance ratios of 0.20, 0.30 and 0.35. Based on the data obtained, it is concluded that: (1) there appears to be no strong correlation between blade torsion loads and rotor performance prediction; (2) for a given rotor test at each advance ratio investigated, both the azimuthal variation of torsional moment and the mean torsional moment at 91% radius are configuration dependent; (3) reducing the nose down twist on the advancing blade appears to be more important to forward flight performance than increasing the nose down twist on the retreating blade; (4) the rotor inflow model used was important in predicting the performance of the adaptive rotor; and (5) neither rigid blade solidity effects, inflow environment, nor blade torsion loads can be used alone to accurately predict airfoil rotor performance. A.R.H.

N82-13108# National Aerospace Lab., Tokyo (Japan).

AN AERODYNAMIC DESIGN AND THE OVERALL STAB

PERFORMANCE OF AN AIR-COOLED AXIAL-FLOW TURBINE
Atsumasa Yamamoto, Kitao Takahara, Hiroyuki Nouse, Shigeo Inoue, Hiroschi Usui, and Fugio Mimura Jan. 1981 44 p refs
(NAL-TR-321T) Avail: NTIS HC A03/MF A01

In order to investigate air-cooled turbines for application to high-temperature engines, a single stage turbine with a 0.56-m (22-inch) tip diameter was designed. The aerodynamical design procedures of the turbine are presented. The stator and rotor blades are characterized by low blade solidity, thick blade section, blunt leading edge and trailing edge, and low blade aspect ratio. A cold air test without supply of cooling air was conducted to determine the turbine aerodynamic performance. The highest efficiency obtained over the range of conditions investigated was 0.865. The turbine satisfied the equivalent design value of specific work output at the design condition (i.e., at equivalent design speed and equivalent design pressure ratio) with an efficiency of 0.856. Detailed surveys of rotor-outlet gas flow were made with Pitot tubes and temperature sensors and the results are also presented. T.M.

N82-13110*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRESSURE DISTRIBUTIONS ON THREE DIFFERENT CRUCIFORM AFT-TAIL CONTROL SURFACES OF A WINGLESS MISSILE AT MACH 1.60, 2.36, AND 3.70. VOLUME 1: TRAPEZOIDAL TAIL
Milton Lamb, Wallace C. Sawyer, Donald L. Wassum, and C. Donald Babb Aug. 1979 345 p
(NASA-TM-80097; L-12993-Vol-1) Avail: NTIS HC A15/MF A01 CSCL 01A

The results of pressure distribution tests conducted in a wind tunnel are presented without analysis. The data were obtained for trapezoidal aft tail control surfaces on a wingless missile model at Mach numbers of 1.60, 2.36, and 3.70 for angles of attack from -4 to 20 deg model roll angles from 0 to 90 deg and tail deflections of 0 and -15 deg. The test Reynolds number used was 6.6 million per meter. M.D.K.

N82-13112*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THRUST MODULATION METHODS FOR A SUBSONIC V/STOL AIRCRAFT
Richard R. Woollett 1981 18 p refs Presented at V/STOL Conf., Palo Alto, Calif., 7-9 Dec. 1981; sponsored by AIAA and NASA Ames
(NASA-TM-82747; E-1063) Avail: NTIS HC A02/MF A01 CSCL 01A

Low speed wind tunnel tests were conducted to assess four methods for attaining thrust modulation for V/STOL aircraft. The four methods were: (1) fan speed change, (2) fan nozzle exit area change, (3) variable pitch rotor (VPR) fan, and (4) variable inlet guide vanes (VIGV). The interrelationships between inlet and thrust modulation system were also investigated using a double slotted inlet and thick lip inlet. Results can be summarized as: (1) the VPR and VIGV systems were the most promising, (2) changes in blade angle to obtain changes in fan thrust have significant implications for the inlet, and (3) both systems attained required level of thrust with acceptable levels of fan blade stress. M.D.K.

N82-13115# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).
A CALCULATION METHOD FOR SLENDER WING-BODY CONFIGURATIONS IN SUPERSONIC FLOW AT HIGH ANGLES OF ATTACK [EIN BERECHNUNGSVERFAHREN FUER SCHLANKE FLUEGEL-RUMPFANORDNUNGEN IM UEBERSCHALL BEI HOHEN ANSTELLWINKELN]
D. Nikolitsch Bonn Bundesministerium der Verteidigung 1979 58 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-79-15) Avail: NTIS HC A04/MF A01; DOK-ZENTBw, Bonn DM 30

An analysis which determines nonlinear force and pitching moment characteristics of slender bodies and slender wing-body configurations at high angles of attack in supersonic flow is presented. The linear coefficients of the body are calculated by means of a singularity distribution along the body axis. The nonlinear coefficients are determined by a method based on Wardlaw's multivortex model which is modified so that it is applicable at Mach > 1. The wing characteristics are calculated with the Huerlimann prediction method; this method is limited to slender, tapered wing planforms. The mutual interference of wing and body is accounted for by Nielsen interference factors. The range of application of the analysis is exemplified by sample calculations. Author (ESA)

N82-13116# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Unternehmensbereich Flugzeuge.
FINAL REPORT ON THE FUEFO-4 MAJOR THEME: INTERFERENCE DRAG WITH AIRFRAME/ENGINE INTEGRATION ON FIGHTER AIRCRAFT Final Report [ABSCHLUSSBEREICHT ZUM RUEFO-4 RAHMENTHEMA 'INTERFERENZWIDERSTAND BEI DER ZELLEN-/TREIBWERKSINTEGRATION VON KAMPFFLUGZEUGEN']
H. L. Weinreich and R. Smyth (Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, West Germany) Bonn Bundesministerium der Verteidigung 1979 182 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-79-20) Avail: NTIS HC A09/MF A01; DOK-ZENTBw, Bonn DM 40

Theoretical and experimental (wind tunnel) studies of engine nozzle characteristics as well as of engine/airframe aerodynamic interaction are summarized. Results significant to fighter aircraft configuration optimization are identified. Wind tunnel experiment design is also critically assessed. Results emphasized concern: experimental data for parameters influencing afterbody drag; theoretical and construction concepts of variable 'CONDI' nozzles; theoretical methods for the correction of wind tunnel data; the synthesis of inlet drag; and investigations of jet decay structures. Author (ESA)

N82-13131*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
GROUP 1: SCENARIO DESIGN AND DEVELOPMENT ISSUES
Peter Sherwin *In its* Guidelines for Line-oriented Flight Training, Vol. 2 1981 p 113-117

Avail: NTIS HC A08/MF A01 CSCL 05I

All LOFT scenarios and flight segments should be designed on the basis of a detailed statement of specific objectives. These objectives must state what kind of situation is to be addressed and why. The origin, routing, and destination of a particular scenario should be dictated by the specific objectives for that scenario or leg. Other factors to be considered are the desired weather, climate, etc. Simulator visual system, as well as other capabilities and limitations must be considered at a very early stage of scenario design. The simulator navigation area must be apropriate and must coincide with current Jeppeson charts. Much of the realism of LOFT is destroyed if the crew is unable to use current manuals and other materials. A.R.H.

N82-13135# SCI Systems, Inc., Huntsville, Ala.
TECHNIQUES FOR INTERFACING MULTIPLEX SYSTEMS Final Report, 10 Sep. 1979 - 10 May 1980
James P. Gross Feb. 1981 138 p
(Contract F33615-79-C-1878; AF Proj. 2003)
(AD-A101457; AFWAL-TR-80-1223) Avail: NTIS HC A07/MF A01 CSCL 17/2

Data describing the characteristics of a number of aircraft multiplex systems were collected and compiled. Although Air Force aircraft received priority, were consideration was also given to other military and commercial aircraft. The F-16, B-52 OAS, YAH-64, F-18, F-15 and ARINC 575 systems were included. MIL-STD-1553B was used as a baseline for comparison. The compiled data was analyzed to determine points of incompatibility between these systems and a feasibility study was performed to assess possible techniques to be used in achieving bus compatibility. A programmable interface module design philosophy is recommended which utilizes a distributed three-microprocessor arrangement to achieve the desired interface compatibility. The three-processor conept allows three independent software-controlled events to occur simultaneously, thus providing an extremely high degree of flexibility both for existing systems and for future growth. Author

N82-13138# Institute for Defense Analyses, Arlington, Va. Program Analysis Div.
HELICOPTER RELIABILITY AND MAINTAINABILITY

TRENDS DURING DEVELOPMENT AND PRODUCTION

Final Report

Norman J. Asher, Lee L. Douglas, and Ray H. Jakobovits Jul. 1981 279 p refs Revised

(Contract MDA903-79-C-0320)

(AD-A105775; AD-E500406; IDA/HQ-81-23636) Avail: NTIS HC A13/MF A01 CSCL 01/3

This study updates and extends IDA Study S-451, 'Changes in Helicopter Reliability/Maintainability Characteristics Over Time,' dated March 1975. This study presents more recent data and, based on the combined data of both studies, summarizes the observed helicopter R&M trends. Trends observed during the development phase are compared with those of the production phase. GRA

N82-13137# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Unternehmensbereich Drehfluegler und Verkehr.

SYSTEM IDENTIFICATION HELICOPTER PARAMETERS. DETERMINATION FROM FLIGHT TESTS, PHASE 2 [SYSTEMIDENTIFIZIERUNG DREHFLUEGLER KENNWERT-ERMITTLUNG AUS FLUGMESSUNGEN (PHASE 2)]

M. Kloster and S. Attlfellner Bonn Bundesministerium der Verteidigung 1980 92 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung

(BMVg-FBWT-80-12) Avail: NTIS HC A05/MF A01; DOK-ZENTw, Bonn DM 30

A parameter identification program for a hingeless rotor helicopter is considered. Flight conditions were selected with increasing instability, i.e., hover and level flight at maximum speed; with maximum weight and with a rearward center of gravity. A strap down system was chosen to provide the attitude feedback control necessary for proper identification. The control input signals were optimized for the unstabilized helicopter. Calculations in the time and frequency domains show that special distributions in the power spectrum of the input signals are needed for optimizing the closed loop system. The identified derivatives and the smoothened time histories from flight tests are compared with the identification results of linear and nonlinear simulations and of the quasistatic theory. Author (ESA)

N82-13138# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

MANEUVER LOAD CONTROL FOR THE REDUCTION OF DESIGN LOADS AND IMPROVEMENT OF THE MANEUVERABILITY OF MODERN FIGHTER AIRCRAFT

Horst Balke Bonn Bundesministerium der Verteidigung 1981 283 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung

(BMVg-FBWT-81-2) Avail: NTIS HC A13/MF A01; DOK-ZENTBw, Bonn DM 50

Active control technology is applied and the feasibility of design load reduction is analyzed. The influence of direct force control on aircraft component loads and on aircraft maneuverability is seen. The deflection of secondary control surfaces in proportion with the commanded control surface was investigated in an open loop control system. Load reduction efficiency diagrams and tables are presented. A comparison of two different aircraft shows that with an open loop control system a considerable reduction in design load is possible. The loads acting on several aircraft components for different open loop control systems are compared. Several closed loop control systems with aircraft response feedback parameters were also investigated. The results are again presented as diagrams, and tables. Only in some cases does closed loop control achieve better results than open loop control. The best design load reduction is achieved with a combined open and closed loop control system. The investigation results are comprehensively evaluated and the parameters relevent for design load reduction are summarized. Author (ESA)

N82-13139 Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

RAVEN AIRCRAFT FILTER-ABSORBER

Jerzy Chojnacki 26 Nov. 1980 5 p Transl. into ENGLISH from Skrzydlata Polska (Poland), Vol. 1, no. 51-52, 1979 p 7

(AD-A098962; FTD-ID(RS)T-2017-80) HC A02/MF A01 CSCL 06/11

A filter-absorber in the shape of a rectangular box and weighing 9.5 kg is mounted outside the cockpit of an agricultural aircraft. Toxic compounds given off during crop spraying are trapped by internal filters. The first, or forward filter has Anilana fibers. The second, or actual purification filter, is made from fiberglass which absorbs the finest airborne contaminants. The pesticide filter-absorber device is guaranteed for 100 hours of operation and was designed for use in Africa. A.R.H.

N82-13140*# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

PRACTICAL ASPECTS OF INSTRUMENTATION SYSTEM INSTALLATION, VOLUME 13

R. W. Borek, A. Pool, ed., and K. C. Sanderson, ed. Sep. 1981 197 p refs

(NASA-TM-84087; AGARD-AG-160-Vol-13; ISBN-92-835-1399-1) Avail: NTIS HC A09/MF A01 CSCL 01D

A review of factors influencing installation of aircraft flight test instrumentation is presented. Requirements, including such factors as environment, reliability, maintainability, and system safety are discussed. The assessment of the mission profile is followed by an overview of electrical and mechanical installation factors with emphasis on shock/vibration isolation systems and standardization of the electric wiring installation, two factors often overlooked by instrumentation engineers. A discussion of installation hardware reviews the performance capabilities of wiring, connectors, fuses and circuit breakers, and a guide to proper selections is provided. The discussion of the installation is primarily concerned with the electrical wire routing, shield terminations and grounding. Also inclued are some examples of installation mistakes that could affect system accuracy. System verification procedures and special considerations such as sneak circuits, pyrotechnics, aircraft antenna patterns, and lightning strikes are discussed. M.D.K.

N82-13141# General Electric Co., Binghamton, N.Y. Aircraft Equipment Div.

ELECTRONIC MASTER MONITOR AND ADVISORY DISPLAY SYSTEM TEST AND DEMONSTRATION REPORT

Interim Report, Jan. - Jun. 1981

Jun. 1981 52 p

(Contract DAAK80-79-C-0270)

(AD-A105317; ACS-12386; AVRADCOM-TR-79-0270-5; IR-5) Avail: NTIS HC A04/MF A01 CSCL 01/4

The hardware and software of the electronic master monitor and advisory display system are tested. The results are documented and the feasibility of the system is demonstrated. Author

N82-13142*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NUMERICAL ANALYSIS OF THE SCRAMJET-INLET FLOW FIELD BY USING TWO-DIMENSIONAL NAVIER-STOKES EQUATIONS

Ajay Kumar Dec. 1981 30 p refs

(NASA-TP-1940; L-14776) Avail: NTIS HC A03/MF A01 CSCL 21E

A computer code was developed to solve the full two dimensional Navier-Stokes equations in a supersonic combustion ramjet (scramjet) inlet. In order to be able to consider a general inlet geometry with embedded bodies, a numerical coordinate transformation is used which generates a set of boundary-fitted curvilinear coordinates. The explicit finite difference algorithm of MacCormack is used to solve the governing equations. An algebraic, two-layer eddy-viscosity model is used for the turbulent flow. The code can analyze both inviscid and viscous flows with no strut, one strut, or multiple struts in the flow field. The application of the two dimensional analysis in the preliminary parametric design studies of a scramjet inlet is discussed. Detailed results are presented for one model problem and for several actual scramjet-inlet configurations. R.J.F.

N82-13143*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF FUEL-AIR-RATIO NONUNIFORMITY ON EMISSIONS OF NITROGEN OXIDES

Valerie J. Lyons Nov. 1981 14 p refs

(NASA-TP-1798; E-848) Avail: NTIS HC A02/MF A01 CSCL 21E

The inlet fuel-air ratio nonuniformity is studied to determine how nitrogen oxide (NOx) emissions are affected. An increase in NOx emissions with increased fuel-air ratio nonuniformity for average equivalence ratios less than 0.7 and a decrease in NOx emissions for average equivalence ratios near stoichiometric is predicted. The degree of uniformityy of fuel-air ratio profiles that is necessary to achieve NOx emissions goals for actual engines that use lean, premixed, prevaporized combustion systems is determined. S.L.

N82-13144*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A REAL TIME PEGASUS PROPULSION SYSTEM MODEL FOR VSTOL PILOTED SIMULATION EVALUATION
James R. Mihaloew, Stephen P. Roth (Pratt and Whitney Aircraft Group, West Palm Beach, Fla.), and Robert Creekmore (Pratt and Whitney Aircraft Group, West Palm Beach, Fla.) 1981 18 p refs Presented at VSTOL Conf., Palo Alto, Calif., 7-9 Dec. 1981; sponsored by AIAA and NASA. Ames Research Center
(NASA-TM-82770; E-1004; AIAA-81-2663) Avail: NTIS HC A02/MF A01 CSCL 21E

A real time propulsion system modeling technique suitable for use in man-in-the-loop simulator studies was developed. This technique provides the system accuracy, stability, and transient response required for integrated aircraft and propulsion control system studies. A Pegasus-Harrier propulsion system was selected as a baseline for developing mathematical modeling and simulation techniques for VSTOL. Initially, static and dynamic propulsion system characteristics were modeled in detail to form a nonlinear aerothermodynamic digital computer simulation of a Pegasus engine. From this high fidelity simulation, a real time propulsion model was formulated by applying a piece-wise linear state variable methodology. A hydromechanical and water injection control system was also simulated. The real time dynamic model includes the detail and flexibility required for the evaluation of critical control parameters and propulsion component limits over a limited flight envelope. The model was programmed for interfacing with a Harrier aircraft simulation. Typical propulsion system simulation results are presented. M.D.K.

N82-13145*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.
SENSOR FAILURE DETECTION SYSTEM Final Report
E. C. Beattie, R. F. LaPrad, M. E. McGlone, S. M. Rock, and M. M. Akhter Aug. 1981 172 p refs Prepared in cooperation with Systems Control, Inc., Palo Alto, Calif.
(Contract NAS3-22481)
(NASA-CR-165515; PWA-5736-17) Avail: NTIS HC A08/MF A01 CSCL 21E

Advanced concepts for detecting, isolating, and accommodating sensor failures were studied to determine their applicability to the gas turbine control problem. Five concepts were formulated based upon such techniques as Kalman filters and a screening process led to the selection of one advanced concept for further evaluation. The selected advanced concept uses a Kalman filter to generate residuals, a weighted sum square residuals technique to detect soft failures, likelihood ratio testing of a bank of Kalman filters for isolation, and reconfiguring of the normal mode Kalman filter by eliminating the failed input to accommodate the failure. The advanced concept was compared to a baseline parameter synthesis technique. The advanced concept was shown to be a viable concept for detecting, isolating, and accommodating sensor failures for the gas turbine applications. M.G.

N82-13146*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NASA RESEARCH IN AIRCRAFT PROPULSION
Milton A. Beheim 1982 17 p Proposed for presentation at the 27th Ann. Intern. Gas Turbine Conf., London, 18-22 Apr. 1982; sponsored by ASME
(NASA-TM-82771; E-1096) Avail: NTIS HC A02/MF A01 CSCL 21E

A broad overview of the scope of research presently being supported by NASA in aircraft propulsion is presented with emphasis on Lewis Research Center activities related to civil air transports, CTOL and V/STOL systems. Aircraft systems work is performed to identify the requirements for the propulsion system that enhance the mission capabilities of the aircraft. This important source of innovation and creativity drives the direction of propulsion research. In a companion effort, component research of a generic nature is performed to provide a better basis for design and provides an evolutionary process for technological growth that increases the capabilities of all types of aircraft. Both are important. A.R.H.

N82-13147*# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
DESIGN FOR ACTIVE AND PASSIVE FLUTTER SUPPRESSION AND GUST ALLEVIATION Ph.D. Thesis
Mordechay Karpel Washington NASA Nov. 1981 117 p refs
(Grant NGL-05-020-243)
(NASA-CR-3482) Avail: NTIS HC A06/MF A01 CSCL 01C

Analytical design techniques for active and passive control of aeroelastic systems are based on a rational approximation of the unsteady aerodynamic loads in the entire Laplace domain, which yields matrix equations of motion with constant coefficients. Some existing schemes are reviewed, the matrix Pade approximant is modified, and a technique which yields a minimal number of augmented states for a desired accuracy is presented. The state-space aeroelastic model is used to design an active control system for simultaneous flutter suppression and gust alleviation. The design target is for a continuous controller which transfers some measurements taken on the vehicle to a control command applied to a control surface. Structural modifications are formulated in a way which enables the treatment of passive flutter suppression system with the same procedures by which active control systems are designed. A.R.H.

N82-13148*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LIMITED EVALUATION OF AN F-14A AIRPLANE UTILIZING AN AILERON-RUDDER INTERCONNECT CONTROL SYSTEM IN THE LANDING CONFIGURATION
Wendell W. Kelley and Einar K. Enevoldson (NASA. Dryden Flight Research Center) Dec. 1981 39 p refs
(NASA-TM-81972; L-14756) Avail: NTIS HC A03/MF A01 CSCL 01C

A flight test was conducted for preliminary evaluation of an aileron-rudder interconnect (ARI) control system for the F-14A airplane in the landing configuration. Two ARI configurations were tested in addition to the standard F-14 flight control system. Results of the flight test showed marked improvement in handling qualities when the ARI systems were used. Sideslip due to adverse yaw was considerably reduced, and airplane turn rate was more responsive to pilot lateral control inputs. Pilot comments substantiated the flight data and indicated that the ARI systems were superior to the standard control system in terms of pilot capability to make lateral offset corrections and heading changes on final approach. Author

N82-13149*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
ANALYSIS OF A LONGITUDINAL PILOT-INDUCED OSCILLATION EXPERIENCED ON THE APPROACH AND LANDING TEST OF THE SPACE SHUTTLE
John W. Smith Dec. 1981 45 p refs
(NASA-TM-81366) Avail: NTIS HC A03/MF A01 CSCL 05H

During the final free flight (FF-5) of the shuttle's approach and landing tests, the vehicle experienced pilot-induced oscillations near touchdown. The light test data showed that pilot inputs to the hand controller reached peak-to-peak amplitudes of 20 deg at a frequency between 3 and 3.5 radians per second. The controller inputs were sufficient to exceed the priority rate limit set in the pitch axis. A nonlinear analytical study was conducted to investigate the combined effects of pilot input, rate limiting, and time delays. The frequency response of the total system is presented parametrically as a function of the three variables. In general, with no dead time, for controller inputs of 5 deg or less, the total system behaves in a linear fashion. For 10 deg of controller input, independent of the delay time, the elevon loop will be rate saturated above a frequency of 4 radians per second. Author

N82-13150*# Purdue Univ., Lafayette, Ind. School of Aeronautics and Astronautics.
INTERACTIVE AIRCRAFT FLIGHT CONTROL AND AEROELASTIC STABILIZATION Interim Report
Terrence A. Weisshaar and David K. Schmidt 31 Oct. 1981 39 p refs
(Grant NAG1-157)
(NASA-CR-165036) Avail: NTIS HC A03/MF A01 CSCL 01C

Several examples are presented in which flutter involving interaction between flight mechanics modes and elastic wind bending occurs for a forward swept wing flight vehicle. These results show the basic mechanism by which the instability occurs and form the basis for attempts to actively control such a vehicle. A.R.H.

N82-13186*# San Jose State Univ., Calif.

DEVELOPMENT AND TESTING OF DRY CHEMICALS IN ADVANCED EXTINGUISHING SYSTEMS FOR JET ENGINE NACELLE FIRES Final Report

Robert L. Altman, A. Campbell Ling, ed., Ludwig A. Mayer, and Donald J. Myronik Sep. 1979 314 p
(Grant NsG-2165)
(NASA-CR-165011) Avail: NTIS HC A14/MF A01 CSCL 21B

The effectiveness of dry chemical in extinguishing and delaying reignition of fires resulting from hydrocarbon fuel leaking onto heated surfaces such as can occur in jet engine nacelles is studied. The commercial fire extinguishant dry chemical tried are sodium and potassium bicarbonate, carbonate, chloride, carbamate (Monnex), metal halogen, and metal hydroxycarbonate compounds. Synthetic and preparative procedures for new materials developed, a new concept of fire control by dry chemical agents, descriptions of experiment assemblages to test dry chemical fire extinguishant efficiencies in controlling fuel fires initiated by hot surfaces, comparative testing data for more than 25 chemical systems in a 'static' assemblage with no air flow across the heated surface, and similar comparative data for more than ten compounds in a dynamic system with air flows up to 350 ft/sec are presented. S.L.

N82-13442 Purdue Univ., Lafayette, Ind.

MEASURED PAVEMENT RESPONSE TO TRANSIENT AIRCRAFT LOADINGS Ph.D. Thesis

Thomas Dale White 1981 243 p
Avail: Univ. Microfilms Order No. 8123723

Pavement deformation response to aircraft traffic was studied. Linear variable differential transducers (LVDT's) were installed in an active taxiway. The LVDT's were attached to reference rods anchored at 16, 36, 120, and 209 in. Basic pavement responses, information on how pavement layers accommodate dynamic loads, as well as data to compare vertical deformations predicted by a theoretical model were examined. A finite difference solution was used to predict pavement temperatures. The solution is shown to have limited application for predicting pavement temperatures. The pavement response phenomena reported are significant. They expose pavement responses that have been minimized in past research but must now be considered. Current theoretical models used in pavement analysis or design are limited in predicting pavement response phenomena. They do not represent the observed compression and extension in a pavement under and away from actual aircraft loads. Dissert. Abstr.

N82-13457# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).

STRUCTURAL DYNAMICS: MODIFIED CALCULATIONS

G. Hornung and H. Roehrle Bonn Bundesministerium der Verteidigung 1981 83 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-81-1) Avail: NTIS HC A05/MF A01; DOKZENTBw, Bonn DM 30

Calculation methods which give natural and harmonically excited vibrations of modified structures, using the results of the original systems, are presented and tested. Most of the methods are based on a linear approximation, i.e., the individual terms of the equations of motion are subdivided into those of the original system and into corresponding difference terms whose products are subsequently neglected. Tests are carried out for simple models as well as for three-dimensionally idealized wing and aircraft structures. Concerning natural vibrations, it is difficult to estimate the achieved accuracy without knowing the exact results. The applied methods are Wielandt iteration and subspace iteration. Using the original natural modes as starting vectors leads to a considerable reduction in computation cost, even with severe modifications. Application of the linear approximation is shown for the reduction of the number of degrees of freedom, which precedes dynamic analysis. Author (ESA)

N82-13613 Tennessee Univ., Knoxville.

PREDICTION OF AERODYNAMIC LOADS ON AIRCRAFTS WITH EXTERNAL STORES AT TRANSONIC SPEEDS Ph.D. Thesis

Chandrasekaran Balasubramanyan 1981 204 p
Avail: Univ. Microfilms Order No. 8123139

The integral equation method was applied to calculate the pressure distribution over an arbitrary, three dimensional lifting wing and a three dimensional wing with an external store, kept beneath the wing. A method to calculate the interference effects imposed by an external store on the wing and vice-versa is given. The wing along transonic solution is analyzed and compared with the experimental results and as well as a wing with an external store. A theory for the flow field nonlinear velocity prediction is developed, programmed, and applied to a wing with an external store configuration and the flow field velocities are compared with the experimental results. The numerical methods for solving the triple and double integrals with limits to infinity are studied and the application of one such method to the flow field prediction problem is briefly indicated. Further extension of this work is indicated with the limitations and advantages. Dissert. Abstr.

N82-13636# Rockwell International Corp., Columbus, Ohio. North American Aircraft Div.

INVESTIGATION OF ACOUSTIC INTERACTIONS IN JET THRUST AUGMENTING EJECTORS Final Report, 1 Jan. 1979 - 30 Sep. 1980

J. R. Campbell, K. D. Korkan (Ohio State Univ., Columbus), and H. Viets (Wright State Univ.) 5 Mar. 1981 244 p refs
(Contract N00019-79-C-0225)
(AD-A106083; NR80H-50) Avail: NTIS HC A11/MF A01 CSCL 20/1

The performance of a constant area rectangular ejector with varying mixing length was investigated to determine the aeroacoustic interaction effects. The rectangular ejector investigation was conducted in two phases. The phase one investigation involved the testing of three different aspect ratio rectangular convergent nozzles at pressures between 15-45 psig to determine the acoustic and jet spreading characteristics. From these data a rectangular ejector incorporating endwall and ejector flap blowing was fabricated and investigated at pressure ratios between 2.0 and 5.0. These investigations were conducted at ejector flap length (L) to ejector throat widths (W), L/W of 11.0, 9.5, 8.0, 6.5, 5.0, 3.5, 2.0, and 0.9 to determine the ejector performance. The data for the rectangular ejector configuration investigated showed an aeroacoustic interaction in the present ratio range of 3.3 - 3.8. However, the resulting performance was not improved to the degree experienced with axisymmetric ejectors. Author (GRA)

N82-13906*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF VACUUM EXHAUST PRESSURE ON THE PERFORMANCE OF MHD DUCTS AT HIGH B-FIELD

J. Marlin Smith, J. L. Morgan, and Shih-Ying Wang 1982 13 p refs Presented at the 20th Aerospace Sci. Meeting, Orlando, Fla., 11-14 Jan. 1982; sponsored by AIAA
(Contract DE-AI01-77ET-10769)
(NASA-TM-82750; DOE/NASA/10769-23; F-1066) Avail: NTIS HC A02/MF A01 CSCL 20I

The effect of area ratio variation on the performance of a supersonic Hall MHD duct is investigated. Results indicate that for a given combustion pressure there exists an area ratio below which the power generating region of the duct is shock free and the power output increases linearly with the square of the magnetic field. For area ratios greater than this, a shock forms in the power generating region which moves upstream with increasing magnetic field strength resulting in a less rapid raise in the power output. The shock can be moved downstream by either increasing the combustion pressure of decreasing the exhaust pressure. The influence of these effects upon duct performance is presented. B.W.

N82-13974# Naval Postgraduate School, Monterey, Calif.

COMPILATION OF ABSTRACTS OF DISSERTATIONS THESES, AND RESEARCH PAPERS SUBMITTED BY CANDIDATES FOR DEGREES, 1 OCTOBER 1979 - 30 SEPTEMBER 1980

Mar. 1981 514 p
(AD-A104124; NPS-012-81-002PR) Avail: NTIS HC A22/MF A01 CSCL 05/2

Abstracts are presented of works submitted in fulfillment of degree requirements in the area of aeronautical, electrical, and mechanical engineering as well as in applied mathematics, applied sciences, and computer sciences. Author

N82-13975# Naval Postgraduate School, Monterey, Calif.
A SUMMARY OF THE NAVAL POSTGRADUATE SCHOOL RESEARCH PROGRAM Summary Report, 1 Oct. 1979 - 30 Sep. 1980
Apr. 1981 528 p
(AD-A104112; NPS-012-81-003PR) Avail: NTIS
HC A23/MF A01 CSCL 05/2

Two hundred thirty research projects are summarized in the following areas: computer science; mathematics; administrative sciences; defense resources management; operations research; national security affairs; physics and chemistry; electrical engineering; meteorology; aeronautics; oceanography; and mechanical engineering. Author

N82-13979# RAND Corp., Santa Monica, Calif.
A NEW APPROACH TO MODELING THE COST OF OWNERSHIP FOR AIRCRAFT SYSTEMS Interim Report
K. E. Marks, H. G. Massey, B. D. Bradley, and J. Lu Aug. 1981 151 p refs
(Contract F49620-77-C-0023)
(AD-A104434; RAND/R-2601-AF) Avail: NTIS
HC A08/MF A01 CSCL 05/1

Support investment costs and recurring operations and support costs are through determined using a model for estimating aircraft cost of ownership (MACO), which also provides a framework for future research. An outgrowth of an earlier evaluation of the strengths and weaknesses of the most widely used aircraft life cycle cost models, MACO combines algorithms for major, maintenance related costs with formulas drawn from existing models for other cost elements. A full set of ownership cost elements is related to component level reliability and maintainability characteristics and to aircraft design, operations, logistics, and deployment parameters. Resource quantities are computed in units that can be related directly to Air Force programming categories, including base maintenance manning (by work center), depot manning, and recoverable spares inventory levels. Output and input parameters accommodate annual changes in system parameters and operating conditions such as component reliability and aircraft inventory size and activity rates. Author

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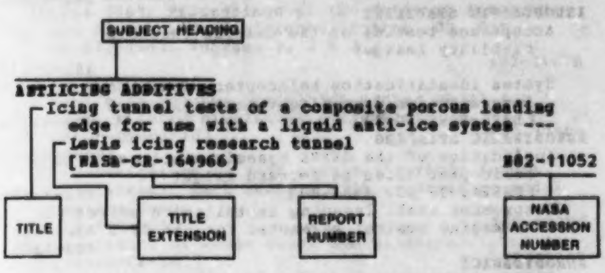
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BIBLIOGRAPHIES
Index of National Aviation Facilities Experimental Center technical reports 1972 - 1977
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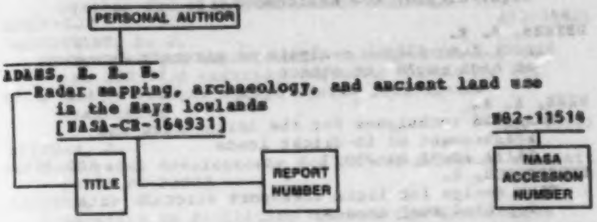

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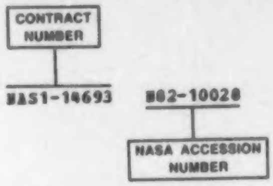

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A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in March 1982 in

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering – A Continuing Bibliography* (NASA SP-7037) lists 347 reports, journal articles, and other documents originally announced in March 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes – subject, personal author, and contract number – are included.

An annual cumulative index will be published.

introduction of new numerical methods during the last few years. It is pointed out that, in the case of the subsonic range, a new procedure is now available for the determination of the form of blade profile on the basis of a given velocity distribution on the profile surface. The search for a profile form with favorable characteristics is consequently transformed into a search for a favorable velocity or pressure distribution on the blade. The distribution of velocities depends to a large degree on the characteristics of the profile boundary layers. The considered concept is not new. However, its practical implementation has only recently become possible. The employment of the new design procedure is illustrated with the aid of an example involving a concrete design problem. G.R.

A82-17136 **The German-Dutch wind tunnel as aeroacoustic experimental installation (Der Deutsch-Niederländische Windkanal als aeroakustische Versuchseinrichtung).** K.-J. Schultz (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung technische Akustik, Braunschweig, West Germany). *DFVLR-Nachrichten*, Nov. 1981, p. 52-56. In German.

The construction of the currently largest European low-speed wind tunnel was completed as a joint project of the Federal Republic of Germany and the Netherlands. The aeroacoustic configuration of the wind tunnel makes use of an open test section and a free jet of air having a length of 20 m. A 8 x 6 m nozzle is employed. Acoustic distant field measurements with respect to test objects exposed to the airstream are possible. Attention is given to the performance of distant field measurements, the sound-absorbing wall surfaces, the acoustic characteristics of the test chamber, and aspects of acoustic calibration. A few characteristic experimental results are also reported. G.R.

A82-17137 **Current investigations regarding noise research in the Braunschweig Center of the German Institute for Research and Experimentation in Aeronautics and Astronautics (Aktuelle Arbeiten der Lärmforschung im DFVLR-Zentrum Braunschweig).** H. Heller (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung technische Akustik, Braunschweig, West Germany). *DFVLR-Nachrichten*, Nov. 1981, p. 56-61. In German.

The German Institute for Research and Experimentation in Aeronautics and Astronautics has established, four years ago, the Department of Technical Acoustics in its Braunschweig research center to conduct research related to the occurrence of noise. The initiation of the investigations conducted in the new department was motivated by the desirability to reduce noise produced at airports in traffic, and in connection with industrial processing operations. The organizational relation of the Department of Technical Acoustics to the research sector of fluid mechanics takes into account the fact that, in aeronautics, the generation of noise is frequently a consequence of turbulent flow and separation processes. Attention is given to investigations concerning the noise produced by aircraft with propeller drive, studies related to helicopter noise, and research regarding the noise generated in connection with the flow of air around aircraft or automobiles. Activities with respect to a use of the German-Dutch Wind Tunnel for aeroacoustic studies are also considered and an outlook concerning future developments is provided. G.R.

A82-17149 **Turboprop resurgence - The next step.** B. Rek. *Interavia*, vol. 36, Dec. 1981, p. 1245-1247.

The prospects for the development of turboprop commercial aircraft in the 40- to 80-seat capacity range are assessed, with attention to the PW120, CT7-5 and -7, and TPE331-14/15 powerplants. Among the performance requirements of aircraft of this class are a cruise speed of approximately 740 km/hr, and a cruise altitude of more than 30,000 ft. These levels of performance would eliminate block-time penalties over sectors of up to 900 km. Among existing designs that may be developed to satisfy the emerging market for state-of-the-art 40-80 seat airliners are the F27, 748, Dash 7, F28 and BAe 146. The aircraft are expected to incorporate advanced avionics, Microwave Landing System (MLS) capability, composite primary structures, supercritical wing aerodynamics, and propfan rotors. O.C.

A82-17243 **Crack edge instability - A criterion for safe crack propagation limit in thin sheets.** B. K. Parida (Indian Institute of Technology, Kharagpur, India). In: Fracture and fatigue: Elasto-plasticity, thin sheet and micromechanisms problems; Proceedings of the Third European Colloquium on Fracture, London, England, September 8-10, 1980. Oxford, Pergamon Press, 1980, p. 307-314. 5 refs.

Results from a series of experiments to determine the safe crack propagation limit of thin aluminum alloy (D16-ATV) sheets under constant amplitude fatigue loading are presented. An empirical relation is developed which can be used to predict the critical crack length associated with the onset of crack-edge instability under constant amplitude loading. The relationship used to correlate the critical half-crack length, L(cr), and the corresponding tensile stress, S, for local buckling of the free edges of a crack is given as S = K x E (T/L(cr))-squared, where T is the sheet thickness, E is the elastic modulus, and K is a constant, depending upon the material properties and the specimen geometry. The critical crack length obtained from the constant amplitude fatigue test was compared to that predicted by the empirical relation; the magnitude of maximum stress in the fatigue test is considered to be equivalent to the critical stress in predicting the critical crack length for the onset of crack-edge instability. The error involved in the prediction is shown to be small. J.F.

A82-17276 **Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980.** Seminar sponsored by the Flight Safety Foundation, Boeing Commercial Airplane Co., Ministry of Transport of New Zealand, et al. Edited by L. J. Scott. Arlington, VA, Flight Safety Foundation, Inc., 1980. 336 p. $30.

Topics discussed include accident prevention and safety, air traffic management for fuel economy, and quality control of fuel from the refinery to the engine. Particular attention is given to air traffic control problems, flight crew management and cockpit performance systems, and gas path analysis for engine condition monitoring. Consideration is also given to energy conservation through airport design and management, and computer flight planning for fuel efficiency. J.F.

A82-17277 **Why safety.** M. Eastburn (American Airlines, Inc., New York, NY). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 13-28.

It is claimed that safety and the prevention of accidents are the greatest conservers of energy. The worldwide commercial jet transport accident experience is briefly described; this description covers the period from 1959, the beginning of the air carrier jet age, through to September 1980. Aircraft lost as a result of sabotage and war-like action, as well as the six Comets lost prior to 1959, are also included in the analysis. Passenger and hull loss liability, and its effect on airline operational costs, are then discussed. Finally, it is estimated that if no action is taken to ensure their prevention, by 1986 there will be an additional 115 hull losses to the present total of 354. J.F.

A82-17278 **Accident prevention - A regulators view.** G. V. Hughes (Department of Transport, Canberra, Australia). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 29-37.

Details of aircraft accidents in the world involving passenger fatalities on scheduled services from 1969 to 1979 are presented and compared to data on general aviation accidents for U.S. and Australian operations. It is shown that the fatalities in general aviation are much greater and continue to grow. Safety prevention is then discussed from the viewpoint of a regulator, who is responsible for the development, implementation, and monitoring of compliance with standards covering all matters to do with aircraft. Problems related to the development of comprehensive and precise standards, as well as the decision to vary these standards when necessary, are discussed. Lack of standardization of controls in fuel systems and undercarriages is used to exemplify the extent of the problem. J.F.

A82-17279 **Air traffic management for fuel economy.** W.

C. W. Fras (National Air Traffic Services, London, England). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 56-74. 9 refs.

Air traffic management, which includes airspace arrangements, air traffic control (ATC) facilities, and ATC procedures, is discussed. In particular, ATC capacities in the U.K. are described, with respect to their means of regulating departures and handling delays so as to minimize the total fuel consumption. It is shown that airspace arrangements and procedures should be devised and operated in such a way that would allow (1) uninterrupted climbs to cruising level; (2) maximun chance of obtaining the optimum cruising level; (3) the shortest practical mileage; and (4) the optimum descent profile. Finally, the operation of an efficient ground movement system is cited as a further means of conserving fuel. J.F.

A82-17280 **The shape of the air traffic control system of the future - A U.S. perspective.** S. B. Poritzky (FAA, Office of Systems Engineering Management, Washington, DC). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 75-82.

Based on recommendations from the user community, the FAA has postulated a safety-and-efficiency-oriented Air Traffic Control (ATC) system, which should be in operation by the start of the 21st century. Problems in the present system are considered from an operations vantage point, as well as from an assessment of expected technology and the possible evolution of aircraft and aviation systems. There will continue to be several levels of ATC service in the U.S., ranging from a highly automated system serving fully participating aircraft in certain airspace to those in which no separation service is provided. Real-time knowledge of actual airport capacity and the use of automated runway configuration management systems will permit the use of optimum airport configurations and scheduling to achieve limited capacity gains. The ATC system will automatically make available severe weather and traffic information. One separation assurance device in particular, the Active Beacon-based Collision Avoidance System, is shown to be an efficient tail cutter which will offer benefits in relatively high-density traffic. J.F.

A82-17281 **Fuel conservation now.** R. A. Davis (Boeing Commercial Airplane Co., Renton, WA). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 83-95.

Boeing is developing improvements for the existing production run of second generation transports, the 727 and 737 aircraft, in order to meet the escalation of jet transport fuel prices. The improvements include reduction in aircraft weight and aerodynamic drag, engine fuel efficiency, and aircraft operational improvements. Applications of a Kapton lightweight wire insulation was shown to save approximately 386 pounds for each 727 and 170 pounds for each 737. A 1% retrofit table drag reduction package is currently available for the 727. The JT8D 'A' series of engines for the -15 and -17 versions promise specific fuel consumption improvements of 5.5% to be available in 1982. The Performance Data Computer coupled with the full range Autothrottle/Speed Control will provide fuel savings up to 7% for the 727 and up to 6% for the 737. J.F.

A82-17282 **Energy savings with today's technology.** H. Dibley (British Airways, Heathrow, Middx., England). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 97-133.

The crew of an aircraft seeks to maximize the energy available in the atmosphere and in the aircraft's fuel so as to ensure the efficient and safe operation of a flight. This is accomplished by displaying clear data in front of the crew, by providing the crew with comprehensive but readily useable information for fuel management (enabling minimum fuel reserves to be carried out), and by relieving the crew of an unnecessary mental work load to use this information. The optimum profile for minimum fuel use involves (1) climbing with maximum thrust at an optimum speed to optimum cruise altitude for a given aircraft weight and wind gradient; (2) cruise climbing as weight decreases; (3) unrestricted descent to the destination field at optimum descent speed with the idle thrust; and (4) selection of a route which takes advantage of the wind structure to fly the minimum air miles. This can be accomplished by supplying the crew with meteorological information, the fuel flight plan, as well as knowledge of the fuel reserves. A minimum safe altitude display on the pilot's panel is also suggested. J.F.

A82-17283 **Air traffic control problems and solutions.** C. W. Vietor. In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 137-152. 14 refs.

The inefficiencies of the present Air Traffic Control (ATC) system are both costly and hazardous to the U.S. airlines network. An improved ATC system is sought which will make use of predetermined flight profiles and time schedules as well as airborne and ground-based computers for transmitting and receiving operational data. The new system is required to (1) improve safety in flight (2) make more efficient use of the airspace; (3) have greater fuel efficiency; (4) make better use of airport runways; and (5) improve flight instrument systems. Several relatively inexpensive solutions to the above criteria are discussed. J.F.

A82-17284 **Productivity and safety.** D. R. Clifford (Boeing Commercial Airplane, Co., Renton, WA). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 153-165.

Due to the effect of fuel price increases on direct operating costs, more fuel-efficient designs for new transport aircraft are sought. This effort includes the use of increased wing span, advanced air foils, better materials, flight management avionics systems, and more efficient engines. The lower costs available through a reduction in crew complement have also been cited. Results of accident statistics are analyzed in order to resolve the controversial two or three-member flight crew issue. It is concluded that two-crew aircraft have a better safety record than three-crew aircraft, and that a jet transport designed for operation by two pilots can be at least as safe as one designed for operation by three. J.F.

A82-17285 **Flight crew management and cockpit performance systems.** R. N. Buck. In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 166-170.

The performance computer systems in jet aircraft cockpits have the potential for saving fuel and improving the efficient management of aircraft by the flight crew; they also have the potential, however, for increasing work loads, heads-down time, and certain hazards caused by error. Data must therefore be presented so that the crew has maximum use of information with minimum distraction. The performance advisory system displays information on air speed, thrust setting, and required pitch by a digital read-out or by moveable bugs on the air speed indicator and EPR gauges. Having the system work with auto throttles and a set thrust (a performance management system) releases the crew from high concentration on thrust setting and assures that the thrust is set correctly for the current weight and altitude. A flight management system with a more comprehensive cockpit display is envisioned; it would perform such functions as maintenance monitoring, weather data collection, and center-of-gravity management. J.F.

A82-17286 **Gas path analysis - A tool for engine condition monitoring.** L. A. Urban (United Technologies Corp., Hamilton Standard Div., Windsor Locks, CT). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 171-201. 10 refs.

Engine condition diagnostics and monitoring in all phases of

Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 300-302.

A description is presented of the Joint Tactical Information Distribution System (JTIDS) Relative Navigation (RELNAV) off-line simulator. The simulator was originally developed for use as an algorithm design test bed. This effort supported writing specifications for the RELNAV function software package addition to the Hughes Improved Terminal (HIT) operational computer program (OCP). After the design phase the simulator was modified to accommodate detailed step-by-step checkout of the subsequently developed RELNAV software by comparing the simulator's exact solutions with those of the OCP. The JTIDS RELNAV network off-line simulator is comprised of two distinct FORTRAN programs. One of the programs generates up to 12 arbitrary trajectories over a reference ellipsoid. The second simulation program is the RELNAV off-line simulator. Its main tasks are to generate and simulate at each JTIDS time slot real world events for up to 12 net numbers. G.R.

A82-18154 **Post-flight assessment of the JTIDS Rel Nav.** M. S. Greenberg (Dynamics Research Corp., Wilmington, MA) and L. Chin (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 303-312. 5 refs.

Assessment of the Joint Tactical Information Distribution System (JTIDS) Relative Navigation (Rel Nav) function requires accurate and frequent precision navigation data to determine the position, velocity, and attitude errors of each JTIDS terminal under test. An approach was developed to create a synthetic reference for vehicle ground speed and attitude. A postflight Rel Nav data reduction program (RNDRP) was designed to filter the flight-recorded records of uncorrected inertial data at a 4 Hz rate and the asynchronously recorded radar tracking data at a 5-10 Hz rate. The RNDRP is also used to perform quick-look analysis of the Rel Nav function by bypassing the filter/smoother and simply differencing radar tracking data and Rel Nav position data. Attention is given to grid navigation, the Nav controller, grid translation and rotation, the Rel Nav figures-of-merit, the Rel Nav analysis approach, and aspects of RNDRP filter and inertial system integration. G.R.

A82-18155 **A natural parameter-controller specification procedure for an integrated radio/dead reckoner navigation system.** R. Dunn (Intermetrics, Inc., Warminster, PA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 313-317.

A natural parameter-controller specification procedure for an integrated radio/dead reckoner navigation system is presented. The technique is illustrated by computing an upper bound on the achievable performance of a nodeless relative navigation system, which is given in terms of position extrapolation quality and available position quality. This specification procedure furnishes a parametric specification, which is fair when the parameters indicate that the available source qualities, geometry, and supporting equipment are good. The technique also permits a specific graceful degradation as the parameters indicate a weakening of the environment. D.L.G.

A82-18156 **A stable decentralized filtering implementation for JTIDS RelNav.** T. H. Kerr (Intermetrics, Inc., Cambridge, MA) and L. Chin (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 318-329. 45 refs.

Eight alternative decentralized linear estimation schemes are surveyed to find the mechanization most appropriate for stable community relative navigation in the JTIDS RelNav tactical scenario. Discrete-time mechanization equations for the sequentially partitioned algorithm (SPA) and the surely locally unbiased (SLU) filtering are presented, and an analytical proof of asymptotic stability for both SPA and SLU filters are estimated in terms of core memory requirements and operation counts. There are some indications that the RelNav algorithm exhibits some anomalous stability behavior. D.L.G.

A82-18157 **PLRS engineering development testing - Early results.** J. A. Kivett and F. L. Morse (Hughes Aircraft Co., Communications and Radar Div., Fullerton, CA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 330-334. Grant No. DAAB07-76-C-1750.

For all participants, the system (which operates beyond line-of-sight through integral relays) incorporates effective electronic counter-counter measures and provides cryptographically secure digital data communication. Each user has the capability of sending preassigned 2-character messages to furnish data to or request information from the system, as well as 12 character free text message exchanges. PLRS operates both ashore and afloat irrespective of visibility, weather, and terrain. Its configuration guarantees continuity of operation during the transitions of tactical headquarters and allows for survivability even if a major system element becomes inoperative. Full system performance is provided within a 47-km by 47-km primary operating area, and airborne users can be located and tracked (with slightly less accuracy) within a 300-km by 300-km extended operating area. C.R.

A82-18158 **Coordinate transformation in PLRS.** J. M. Lull, F. L. Morse, and R. Cook (Hughes Aircraft Co., Fullerton, CA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 335-338. Grant No. DAAB-07-76-C-1750.

A description is given of the primary coordinate transformation algorithm employed by the Position Location and Reporting System (PLRS), which operates between internal coordinates and the Universal Transverse Mercator (UTM) Military Grid Reference (MGR) coordinates. The PLRS coordinate transformation (1) operates over a 300 x 300 km area, with its given system center anywhere between 80 deg S and 84 deg N latitudes; (2) processes UTM grid zone boundaries, spheroid and datum boundaries, and irregularities in the MGR 100 km grid square identifications; (3) does not require large amounts of on-line storage; and (4) permits datum and MGR grid definitions to be changed easily. O.C.

A82-18159 **Navigation system integrity and reliability for civil aviation.** R. Braff, C. Shively (Mitre Corp., McLean, VA), and J. Bradley (FAA, Washington, DC). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 367-374. 6 refs.

The integrity and reliability of the present primary civil air navigation system, VOR/DME, is discussed to identify and develop an understanding of the specific integrity and reliability performance factors that must be considered when evaluating alternative navigation systems. The identified performance factors are then used to define applicable technical analyses. Major issues relating to the integrity and reliability of the space segment of the Navstar Global Positioning system are discussed. V.L.

A82-18160 * # **Evaluation of Loran-C enroute navigation and non-precision approaches within the State of Vermont.** F. D. MacKenzie (U.S. Department of Transportation, Transportation Systems Center, Cambridge, MA) and C. D. Lytle (NASA, Langley Research Center, Hampton, VA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 375-380.

Results obtained in completing 257 nonprecision approaches and 44 data flights are discussed. The flights were initiated in the summer months and extended through four seasons and practically all weather conditions typical of the northeastern U.S. A preliminary assessment of the available data indicates that Loran-C signals are suitable as a means of navigation during enroute, terminal, and nonprecision approach operations and that the performance exceeds the minimum accuracy criteria specified by the applicable FAA advisory circular. Enroute operations are found to remain within + or - 0.75 nm of the desired track, compared with the requirement of + or - 2.5 nm. Terminal operations remained within + or - 0.65 nm of the desired track, compared with the FAA circular's requirement of + or - 1.5 nm; the nonprecision final approach operations were within the limit of + or - 0.6 nm for all operations. C.R.

A82-18161 # **Helicopter decelerated steep approach and landing to confined areas under instrument meteorological conditions.** P. S. Demko (U.S. Army, Air Traffic Management Systems Div., Fort Monmouth, NJ). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 381-386.

It is shown how small, portable microwave landing guidance systems, used with 4-cue decelerated steep approach and landing (DSAL) flight director systems designed especially for helicopters, can now overcome visibility barriers and provide a true all-visibility DSAL capability. The extension of the DSAL capabilities into the instrument meteorological conditions (IMC) realm is thought to be perhaps the greatest practical step which could be taken to expand the usefulness of helicopters. It is noted that technology has advanced sufficiently to provide the helicopter with IMC DSAL capability at the present time. C.R.

A82-18170 **Status of the COSPAS-SARSAT project and its possible operation in conjunction with INMARSAT system.** Y. G. Zurabov and V. A. Bogdanov (Vsesoiuznoe Ob'edinenie Morsviaz'-sputnik, Moscow, USSR). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 459-467.

The status and main technical characteristics of the COSPAS-SARSAT project are considered, along with the possibility of its operation in conjunction with the INMARSAT system. The COSPAS-SARSAT project is an experimental satellite-aided project for the search and rescue of distressed vehicles, administered by U.S.S.R., U.S., French and Canadian agencies. Both the detection and location of distress signals will be undertaken, and the information facilities for completion of data processing and its further transmission to rescue services. The COSPAS and SARSAT projects interoperate at 121.5 and 406.0 MHz. Detailed block diagrams are given of the COSPAS system's spaceborne equipment and functions. O.C.

A82-18171 **Enhanced noise immunity and error control in a fully integrated JTIDS/GPS receiver.** H. J. Rome (Lowell, University, Lowell, MA), R. A. Reilly, and C. D. Ward (ITT, ITT Avionics Div., Nutley, NJ). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 477-493. 13 refs.

The functional design of an integrated Joint Tactical Information Distribution System/Global Positioning System (JTIDS/GPS) receiving network, using data fragments from multiple sources to obtain dramatic improvement in positional reliability in an adverse signal environment, is described. It is shown that proper selection and synergistic use of data from both systems improve positional reliability under certain noise environments by up to four orders of magnitude. The higher the number of fully integrated terminals in the network, the greater the improvement in jam resistance; significant improvement, however, is attainable to an entire network by having even a limited number of integrated terminals. The key to the system is the use of 'smart' data source selection logic to properly weigh and choose the best current data available from JTIDS and GPS sources for navigation updating. C.R.

A82-18182 **The electromagnetic theta gun and tubular projectiles.** T. J. Burgess, E. C. Cnare, W. L. Oberkampf, S. G. Beard, and M. Cowan (Sandia National Laboratory, Albuquerque, NM). *(U.S. Army Armaments Research and Development Command and Defense Advanced Research Projects Agency, Conference on Electromagnetic Guns and Launchers, San Diego, CA, Nov. 4-6, 1980.) IEEE Transactions on Magnetics,* vol. MAG-18, Jan. 1982, p. 46-59. 15 refs. Research supported by the U.S. Department of Energy.

Unlike the better known rail gun, the theta gun applies the propelling force along the length of its projectile. This is shown to allow much greater acceleration of high fineness ratio projectiles for a given barrel pressure, allowing much shorter barrels for military applications. A computer code which simulates performance of the theta gun is described and experimental results from a few simple, low energy experiments show close agreement with code predictions. Trajectories and aerodynamic heating for three candidate military projectiles are calculated for vertical and horizontal atmospheric launches where initial velocity is as high as 5 km/s. The calculations indicate that in some cases a thin layer of heatshield (ablator) will be required to control projectile heating. (Author)

A82-18200 **Helical rail glider launcher.** P. Mongeau and F. Williams (MIT, Cambridge, MA). *(U.S. Army Armaments Research and Development Command and Defense Advanced Research Projects Agency, Conference on Electromagnetic Guns and Launchers, San Diego, CA, Nov. 4-6, 1980.) IEEE Transactions on Magnetics,* vol. MAG-18, Jan. 1982, p. 190-193. NSF-supported research; Grant No. DAAK10-79-C-0184.

The electromagnetic acceleration group at MIT has undertaken to build an electric glider launcher. The launcher features a mobile helical rail accelerator and power supply. It will launch a 6 foot radio-controlled glider for an overall range of several miles. This device is a prototype for a larger system that will provide a launch platform for munition and supply loaded gliders and a wide variety of RPV's. A 6 meter helical rail launcher has been constructed and is being tested. It is a twin boom device designed to accelerate a 5 kg glider to 100 m/s at 100 g's acceleration. (Author)

A82-18272 **Data communications within the Air Navigation Services system.** W. J. A. Vonk (Philips Telecommunicatie Industrie, Hilversum, Netherlands). *The Controller,* vol. 20, Dec. 1981, p. 17, 18.

A comparison is made between: (1) the Société Internationale des Télécommunications Aéronautique (SITA) communications network, which consists of 12,000 stations in 800 cities and employs land lines, radio links, and satellites for the transmission of passenger and cargo handling, averaging 3-sec in replying to information requests; and (2) the Aeronautical Fixed Telecommunication Network (AFTN), which is not suited to request/reply traffic, and supports the Air Navigation Services (ANS) system. Suggestions are made for the upgrading of the AFTN, based on a color graphics terminal that gives access to stored aeronautical information. Such a unit has been demonstrated in air traffic control roles, and presents through carefully selected function keys such information as airspace and route data, local regulations and weather data. O.C.

A82-18273 **Modernizing the Egyptian A.T.C. system.** R. Kahane. *The Controller,* vol. 20, Dec. 1981, p. 19, 20, 22, 23.

A description is given of plans for the modernization of the Egyptian ATC system, through the phased implementation of systems and services. The plan includes the modernization of: (1) the radar detection network; (2) radar data processing and display; (3) flight plan processing and display; (4) air-to-ground, and both domestic and international point-to-point communications networks, including telephonic and telegraphic links and HF, VHF and UHF radio and microwave links; also (5) the extension of navigation aids; and (6) the modernization of controller training programs. The installation of these systems throughout the country will, moreover, call for the construction of five building complexes, of which the largest is to be the Cairo Air Navigation Center (CANC), located at Heliopolis Airport. O.C.

A82-18274 # **'Integral Noise': An automatic calculation model for the prediction and control of fixed-wing aircraft noise. I - General considerations, theoretical bases and model analysis ('Integral Noise': Un modello di calcolo automatico per il controllo e la previsione del rumore degli aeromobili ad ala fissa. I - Considerazioni generali, fondamenti teorici ed analisi del modello).** F. Bosa (Consulenza Aeronautica, Mondovi, Italy) and R. Gualdi (Provincia di Milano, Laboratorio di Igiene e Profilassi, Milan, Italy). *Ingegneria,* Sept.-Oct. 1981, p. 267-286. 9 refs. In Italian.

A description is given of the INTNOI Integral Noise Program for advanced aircraft noise prediction and control. This computer model performs, on a modular basis, the analysis of both boundary layer aerodynamic noise and engine noise for the case of such turbofan-powered commercial aircraft as the 737. It also permits the prediction of noise levels due to engine and aerodynamic sources in the communities affected by approach and landing noise footprints. Attention is given to the effect on engine noise levels of low and high

A simulation was developed to investigate the utilization of computer assisted decision making for the task of sequencing and scheduling aircraft in a high density terminal area. The simulation incorporates a desision methodology termed Constrained Position Shifting. This methodology accounts for aircraft velocity profiles, routes, and weight classes in dynamically sequencing and scheduling arriving aircraft. A sample demonstration of Constrained Position Shifting is presented where six aircraft types (including both light and heavy aircraft) are sequenced to land at Denver's Stapleton International Airport. A graphical display is utilized and Constrained Position Shifting with a maximum shift of four positions (rearward or forward) is compared to first come, first serve with respect to arrival at the runway. The implementation of computer assisted sequencing and scheduling methodologies is investigated. A time based control concept will be required and design considerations for such a system are discussed. Author

N82-14829*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

RUGGEDIZED MINICOMPUTER HARDWARE AND SOFTWARE TOPICS, 1981: PROCEEDINGS OF THE 4TH ROLM MIL-SPEC COMPUTER USER'S GROUP CONFERENCE

Dec. 1981 214 p refs Conf. held in San Diego, Calif., 22-25 Feb. 1981
(NASA-CP-2206; L-14886) Avail: NTIS HC A11/MF A01 CSCL 09B

Presentations of a conference on the use of ruggedized minicomputers are summarized. The following topics are discussed: (1) the role of minicomputers in the development and/or certification of commercial or military airplanes in both the United States and Europe; (2) generalized software error detection techniques; (3) real time software development tools; (4) a redundancy management research tool for aircraft navigation/flight control sensors; (5) extended memory management techniques using a high order language; and (6) some comments on establishing a system maintenance scheme. Copies of presentation slides are also included

N82-14830*# Boeing Commercial Airplane Co., Seattle, Wash.

AIRBORNE DATA ANALYSIS/MONITOR SYSTEM

Darryl B. Stephison *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 Dec. 1981 p 1-21

Avail: NTIS HC A11/MF A01 CSCL 09B

An Airborne Data Analysis/Monitor System (ADAMS), a ROLM 1666 computer based system installed onboard test airplanes used during experimental testing is evaluated. In addition to the 1666 computer, the ADAMS hardware includes a DDC System 90 fixed head disk and a Miltape DD400 floppy disk. Boeing designed a DMA interface to the data acquisition system and an intelligent terminal to reduce system overhead and simplify operator commands. The ADAMS software includes RMX/RTOS and both ROLM FORTRAN and assembly language are used. The ADAMS provides real time displays that enable onboard test engineers to make rapid decisions about test conduct thus reducing the cost and time required to certify new model airplanes, and improved the quality of data derived from the test, leading to more rapid development of improvements resulting in quieter, safer, and more efficient airplanes. The availability of airborne data processing removes most of the weather and geographical restrictions imposed by telemetered flight test data systems. A data base is maintained to describe the airplane, the data acquisition system, the type of testing, and the conditions under which the test is performed. M.D.K.

N82-14831*# Boeing Commercial Airplane Co., Seattle, Wash.

ADAMS EXECUTIVE AND OPERATING SYSTEM

W. D. Pittman *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 Dec. 1981 p 23-31

Avail: NTIS HC A11/MF A01 CSCL 09B

The ADAMS Executive and Operating System, a multitasking environment under which a variety of data reduction, display and utility programs are executed, a system which provides a high level of isolation between programs allowing them to be developed and modified independently, is described. The Airborne Data Analysis/Monitor System (ADAMS) was developed to provide a real time data monitoring and analysis capability onboard Boeing commercial airplanes during flight testing. It inputs sensor data from an airplane performance data by applying transforms to the collected sensor data, and presents this data to test personnel via various display media. Current utilization and future development are addressed. M.D.K.

N82-14833*# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Flight Test Management Dept.

ON-BOARD COMPUTER PROGRESS IN DEVELOPMENT OF A 310 FLIGHT TESTING PROGRAM

Pierre Reau *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 Dec. 1981 p 47-57

Avail: NTIS HC A11/MF A01 CSCL 09B

Onboard computer progress in development of an Airbus A 310 flight testing program is described. Minicomputers were installed onboard three A 310 airplanes in 1979 in order to: (1) assure the flight safety by exercising a limit check of a given set of parameters; (2) improve the efficiency of flight tests and allow cost reduction; and (3) perform test analysis on an external basis by utilizing onboard flight types. The following program considerations are discussed: (1) conclusions based on simulation of an onboard computer system; (2) brief descriptions of A 310 airborne computer equipment, specifically the onboard universal calculator (CUB) consisting of a ROLM 1666 system and visualization system using an AFIGRAF CRT; (3) the ground system and flight information inputs; and (4) specifications and execution priorities for temporary and permanent programs. M.D.K.

N82-14839*# National Aerospace Lab., Amsterdam (Netherlands).

ROLM COMPUTERS IN THE FLIGHT TESTING OF THE FOKKER F29 AIRCRAFT

P. J. Manders *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 Dec. 1981 p 171-192

Avail: NTIS HC A11/MF A01 CSCL 09B

The design, development, installation, and operation of the test equipment (MRVS) is discussed. The main feature of the MRVS is continuous recording on an instrumentation recorder data of up to 1500 parameters with a total sample rate of up to 10,000 samples per second. In order to compress the evaluation and calibration time period, the following additional requirements were set for two test systems: (1) recording of selected parameters, time tagged on computer compatible tape (CCT); (2) recording of selected high bandwidth signals and ad hoc parameters on analog tape; (3) onboard presentation of calibrated parameter data, in engineering units, in numerical as well as graphical form for: system checkout during pre-, in- and post-flight, and quick look analysis during in-flight; (4) real time presentation on the ground by telemetry for: flight monitoring, takeoff and landing measurements, and noise measurements; and (5) data processing on the ground on the Fokker-NLR computer network. S.L.

N82-14842*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. Flight Electronics Div.

DESCRIPTION OF A DUAL FAIL OPERATIONAL REDUNDANT STRAPDOWN INERTIAL MEASUREMENT UNIT FOR INTEGRATED AVIONICS SYSTEMS RESEARCH

W. H. Bryant and F. R. Morrell *In its* Ruggedized Minicomputer Hardware and Software Topics, 1981 Dec. 1981 p 209-217 refs

Avail: NTIS HC A11/MF A01 CSCL 09B

An experimental redundant strapdown inertial measurement unit (RSDIMU) is developed as a link to satisfy safety and reliability considerations in the integrated avionics concept. The unit includes four two degree-of-freedom tuned rotor gyros, and four accelerometers in a skewed and separable semioctahedral array. These sensors are coupled to four microprocessors which compensate sensor errors. These microprocessors are interfaced with two flight computers which process failure detection, isolation, redundancy management, and general flight control/navigation algorithms. Since the RSDIMU is a developmental unit, it is imperative that the flight computers provide special visibility and facility in algorithm modification. S.L.

N82-14846*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

APPLICATION OF INTEGRATION ALGORITHMS IN A PARALLEL PROCESSING ENVIRONMENT FOR THE SIMULATION OF JET ENGINES
Susan M. Krosel and Edward J. Milner 1982 25 p refs To be presented at the 15th Ann. Simulation Symp., Tampa, Fla., 17-19 Mar. 1982
(NASA-TM-82746; E-1059) Avail: NTIS HC A02/MF A01 CSCL 12A

The application of Predictor corrector integration algorithms developed for the digital parallel processing environment are investigated. The algorithms are implemented and evaluated through the use of a software simulator which provides an approximate representation of the parallel processing hardware. Test cases which focus on the use of the algorithms are presented and a specific application using a linear model of a turbofan engine is considered. Results are presented showing the effects of integration step size and the number of processors on simulation accuracy. Real time performance, interprocessor communication, and algorithm startup are also discussed. B.W.

N82-14560*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PREDICTION OF FLYOVER JET NOISE SPECTRA FROM STATIC TESTS
Ulf Michel and Alfons Michalke (Technische Univ., Berlin) Dec. 1981 27 p refs Presented at the 100th Meeting of the Acoust. Soc. of Am., Los Angeles, Nov. 1980
(NASA-TM-83219; L-14953) Avail: NTIS HC A03/MF A01 CSCL 20A

A scaling law is derived for predicting the flyover noise spectra of a single-stream shock-free circular jet from static experiments. The theory is based on the Lighthill approach to jet noise. Density terms are retained to include the effects of jet heating. The influence of flight on the turbulent flow field is considered by an experimentally supported similarity assumption. The resulting scaling laws for the difference between one-third-octave spectra and the overall sound pressure level compare very well with flyover experiments with a jet engine and with wind tunnel experiments with a heated model jet. Author

N82-15010# Societe Nationale Industrielle Aerospatiale, Suresnes (France). Lab. Central.
AERONAUTICAL APPLICATIONS OF BONDING [LES APPLICATIONS AERONAUTIQUES DU COLLAGE]
G. Briens 23 Jun. 1981 23 p In FRENCH Presented at Journee d'Information sur le Collage Organisee, Senlis, France, 17 Jun. 1981; sponsored by Federation des Industries Mecaniques et Transformatrices des Metaux and Centre Technique des Industries Mecaniques
(SNIAS-812-551-102; C42-886) Avail: NTIS HC A02/MF A01

Adhesive bonding agents and techniques and their utilization in aircraft construction are reviewed. Adhesives are classified by their physical presentation, chemical nature, normal application, hardening temperature, and by service temperature and life. The principal structures in which adhesives are used include: honeycomb sandwich constructions, panel stiffeners, reinforcing backing, crack arresters, and laminates. Advantages in bonding assembly are mentioned. Mechanical limitations like shear strength, tensile strength, and resistance to peeling or cleaving, are discussed. The growing importance of bonding in the aerospace industry is emphasized. Author (ESA)

N82-15011# Societe Nationale Industrielle Aerospatiale, Suresnes (France). Lab. Central.
ADVANTAGES AND LIMITATIONS IN THE USE OF DIVERSE MATERIALS FOR AIRCRAFT CONSTRUCTION [ATOUTS ET LIMITES D'EMPLOIS DES DIVERS MATERIAUX UTILISES DANS LA CONSTRUCTION DES CELLULES]
G. Hilaire 1981 37 p In FRENCH Presented at 9th Colloq. Aciers et Alliages Speciaux dans les Ind. Aerospatiales, Le Bourget, France, 11 Jun. 1981
(SNIAS-811-551-104) Avail: NTIS HC A03/MF A01

The properties and applications of steels, light alloys, titanium, and carbon composites are compared. A percentage evaluation of their use in civil aircraft, military aircraft, helicopters, and spacecraft shows trends in airframe materials selection. Criteria for the choice of materials are discussed. Mechanical static characteristics, fatigue behavior, ruggedness, and cost are considered. A more widespread utilization of composites is indicated. Author (ESA)

N82-15013*# Cincinnati Univ., Ohio. Dept. of Aerospace Engineering and Applied Mechanics.
FLAP-LAG-TORSIONAL DYNAMICS OR EXTENSIONAL AND INEXTENSIONAL ROTOR BLADES IN HOVER AND IN FORWARD FLIGHT Semiannual Progress Report, Jul. - Dec. 1981
M. R. M. CrespoDaSilva Dec. 1981 6 p refs
(Grant NAG2-38)
(NASA-CR-165079) Avail: NTIS HC A02/MF A01 CSCL 01A

The differential equations describing the flap-lag-torsional motion of a flexible rotor blade including third-order nonlinearities were derived for hover and forward flight. Making use of the two boundary conditions, those equations were reduced to a set of three integro partial differential equations written in terms of the flexural deflections and the torsional variable. L.F.M.

N82-15014*# Vigyan Research Associates, Inc., Hampton, Va.
SUBSONIC BALANCE AND PRESSURE INVESTIGATION OF A 60-DEG DELTA WING WITH LEADING-EDGE DEVICES (DATA REPORT)
Dhanvada M. Rao and Stephen A. Tingas (North Carolina State Univ., Raleigh) Hampton, Va. NASA. Langley Research Center Nov. 1981 126 p refs
(Contract NAS1-16259)
(NASA-CR-165806) Avail: NTIS HC A07/MF A01 CSCL 01A

The drag reduction potential of leading edge devices on a 60 degree delta wing at high lift was examined. Geometric variations of fences, chordwise slots, pylon type vortex generators, leading edge vortex flaps, and sharp leading edge extensions were tested individually and in specific combinations to improve high-alpha drag performance with a minimum of low-alpha drag penalty. The force, moment, and surface static pressure data for angles of attack up to 23 degrees, at Mach and Reynolds numbers of 0.16 and 3.85 x 10 to the 6th power per meter are documented. E.A.K.

N82-15016*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LOW-SPEED AERODYNAMIC PERFORMANCE OF A HIGH-ASPECT-RATIO SUPERCRITICAL-WING TRANSPORT MODEL EQUIPPED WITH FULL-SPAN SLAT AND PART-SPAN DOUBLE-SLOTTED FLAPS
Harry L. Morgan, Jr. and John W. Paulson, Jr. Dec. 1979 145 p refs
(NASA-TP-1580; L-13201) Avail: NTIS HC A07/MF A01 CSCL 01A

An investigation was conducted in the Langley V/STOL tunnel to determine the static longitudinal and lateral-directional aerodynamic characteristics of an advanced high-aspect-ratio supercritical-wing transport model equipped with a full-span leading-edge slat and part-span double-slotted trailing-edge flaps. This wide-body transport model was also equipped with spoiler and aileron control surfaces, flow-through nacelles, landing gear, movable horizontal tails, and interchangeable wing tips with aspect ratios of 10 and 12. The model was tested with leading-edge slat and trailing-edge flap combinations representative of cruise, climb, takeoff, and landing wing configurations. The tests were conducted at free-stream conditions corresponding to Reynolds numbers (based on mean geometric chord) of 0.97 to 1.63 x 10 to the 6th power and corresponding Mach numbers of 0.12 to 0.20, through an angle-of-attack range of -2 deg to 24 deg and a sideslip-angle range of -10 deg to 5 deg. Author

N82-15017*# Boeing Commercial Airplane Co., Seattle, Wash. Preliminary Design Dept.
HIGH LIFT SELECTED CONCEPTS Final Report, Aug. 1977 - Jul. 1978
M. L. Henderson Hampton, Va. NASA Aug. 1979 108 p refs
(Contract NAS1-14742)
(NASA-CR-159083) Avail: NTIS HC A06/MF A01 CSCL 01A

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operation from the test cell to on-wing is recognized as a highly economical procedure. A technique is required, however, whereby engines can be analyzed to the module level in a reliable and technically sound way. Gas Path Analysis (GPA) with multiple simultaneous fault isolation and the ability to deal with measurement noise, has been developed to meet that need. Major GPA activity as of mid-1980 is summarized, based on its use by eight airlines. Results show that GPA is a successful technique and can be used for on-wing engine monitoring to the module level for the new generation aircraft. J.F.

A82-17287 Energy conservation through airport design and management. H. I. F. Ouyang (Civil Aeronautics Administration, Taipei, Republic of China). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 208-233.

Energy conservation principles through airport design and management are described and then compared with those applied at the Chiang Kai-Shek International Airport. The results of the comparison may be used at existing airports, where current systems and operation procedures can be evaluated, and where programs necessary to reduce energy consumption without affecting airport performance may be developed. The analysis should also be considered at the design stage of new airports, where the material specifications of an architectural structure and the technical requirements of mechanical and electrical systems with energy saving functions may be considered and reviewed in order that necessary modifications may be made as early as possible. J.F.

A82-17288 Handling problems associated with jet aircraft fuels. L. C. Quigg (Lockheed Air Terminal, Inc., Burbank, CA). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 234-250. 18 refs.

A good quality control program is needed to eliminate the threat of dirty fuel, a problem that can adversely affect aircraft maintenance and safety. The contaminants that affect fuel cleanliness include particulate matter (rust, millscale, sand), water (dissolved and undissolved), surfactants (refinery carry-overs and fuel additives picked up in pipeline delivery systems), and microorganisms. If not effectively controlled or removed from the fuel, they can cause fuel tank corrosion, tank quantity gage inaccuracies, engine fuel control problems, and filter and screen blockage. An effective quality control program will eliminate these contaminants by (1) verifying the product; (2) detecting the presence and origin of contaminants; (3) effectively removing the contaminants; (4) providing well-designed facilities; and (5) establishing a reliable inspection program. J.F.

A82-17289 Computer flight planning for fuel efficiency. L. M. Reinkens (Lockheed Aircraft Service Co., Ontario, CA). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 256-269.

The need to improve fuel efficiency is forcing the aviation industry to reassess the use of computer flight planning (CFP). In the past decade, CFP was based on mechanizing manual techniques; the demand now is for CFP to take technology one step further into (1) inexpensive on-line conversational systems available throughout the world; (2) refined optimization techniques in route and profile selection to minimize fuel uplift, maximize payload, and extend range; (3) reanalysis enroute to reflect take-off variations and minimize fuel consumption; (4) reanalysis in the event of diversion to an alternate; (5) remote data base entry; and (6) refined reserve fuel consumption. The proposed interactive system and conversational network are given; differences in cruise speeds, fuel, and payload requirements of the Boeing 737 and 747 are illustrated. J.F.

A82-17290 Liquid hydrogen - An outstanding alternate fuel for transport aircraft. W. M. Hawkins. In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 270-295.

Liquid hydrogen is proposed as an excellent alternate aircraft fuel, owing to its worldwide availability, low cost, ability to be transported and stored without difficulty, and minimum impact on the environment. NASA compared the characteristics and performance of three aircraft using (1) synthetic Jet A, (2) liquid methane, and (3) liquid hydrogen. The liquid hydrogen aircraft was found to weigh considerably less than the others, thereby reducing the take-off gross weight. Every pound of hydrogen produces 51,590 BTU's, whereas a pound of Jet A produces only 18,400 BTU's. Moreover the liquid hydrogen aircraft uses the least energy in spite of aerodynamic disadvantages of the aircraft and high energy needs for liquefaction and the manufacturing process. Liquid hydrogen also has a fly-over noise level of 89 decibels compared to the 94 decibels for the Synjet aircraft. A simple system of laminar flow maintenance using liquid hydrogen is discussed, and several safety features of the fuel are noted. J.F.

A82-17310 # NAVSTAR Global Positioning System. J. H. Martel (USAF, Washington, DC). In: Space tracking and data systems; Proceedings of the Symposium, Arlington, VA, June 16-18, 1981. New York, American Institute of Aeronautics and Astronautics, 1981, p. 89-93.

The NAVSTAR Global Positioning System (GPS) is an important new space-based radio navigation system currently under development by the Department of Defense. The system will provide highly accurate three-dimensional position, velocity, and time information to an unlimited number of suitably equipped users anywhere on or near the earth. The system will consist of three segments: the Satellite or Space Segments, the Control Segment, and the User Segment. All three segments are currently in full scale development leading to a full three-dimensional world-wide capability by late 1987. Potential military applications of the system are virtually limitless. Potential civil applications, while currently less well defined than military uses, are also extensive. Testing of early development models have clearly demonstrated that the system has the potential to perform up to near theoretical expectations. Early problems with spacecraft atomic clocks appear to have been solved and the program is progressing on a sound technical basis. The remaining challenge is to achieve an optimum balance to assure that sufficient accuracy is available to satisfy valid civil needs without jeopardizing national security objectives. (Author)

A82-17417 Development of the Lockheed SR-71 Blackbird. C. L. Johnson. *Lockheed Horizons*, Winter 1981-1982, p. 2-7, 13-18.

An account is given of the development history of the SR-71 reconnaissance aircraft, with attention to the use of novel design concepts in high-temperature materials and their fabrication and the aerodynamics required for efficient flight at cruise speeds of Mach 3.0. Consideration is also given to the parallel development of the YF-12A, air defense long-range fighter derivative. Emphasis is placed on the integration of the J58 engine into the SR-71's nacelles, whose inlets, air bleed mechanisms and ejector underwent the greatest portion of wind tunnel testing time for optimization. Age B-120 titanium alloy was chosen as the main structural material, in the form of machined forgings and corrugated skins which resist high-temperature warping. With refueling, the special cockpit and lubrication cooling systems developed allow continuous flights of 15,000 miles. Aircraft of this type have exceeded Mach 3.0 over 11,000 times since becoming operational in 1964. O.C.

A82-17418 J58/SR-71 propulsion integration or the great adventure into the technical unknown. W. H. Brown. *Lockheed Horizons*, Winter 1981-1982, p. 7-13.

The integration of the J58 engine into the SR-71 nacelles is detailed, with attention to the accommodation of such consequences of Mach 3.0 cruise speeds as (1) engine inlet air temperatures exceeding 800 F, (2) fuel inlet temperatures of 350 F, (3) fuel temperatures ranging from 600 to 700 F at the main and afterburner nozzles, and (4) lubricant temperatures of 700-1000 F in localized parts of the engine. A new fuel and a chemical lubricant were developed to meet temperature requirements. Consideration is given to the mounting of the engine, and the air flow patterns induced in the nacelle through the actuation of bypass and suck-in doors, centerbody bleed, and external ejector flaps. Special efforts were made in the solution of engine inlet unstart problems. Testing facilities and development program management are also considered. O.C.

A82-17419 **Modern aircraft accident investigation equipment and techniques.** E. J. Rosenbauer, Sr. (Lockheed Aircraft Service Co., Ontario, CA). *Lockheed Horizons,* Winter 1981-1982, p. 20-27.

A description is given of the design features and operational capabilities of the Model 109 Flight Data Recorder (FDR) and Model 209 Digital Flight Data Recorder (DFDR), with emphasis on the superior survivability standards addressed by the Model 209. The DFDR has operated properly when subjected to (1) vibrations of 5-500 Hz, at 0.036-inch double amplitude and 10 G acceleration, in 15-min cycles for a period of 1 hr in each axis; (2) impact shocks having a peak acceleration magnitude of 1000 G and 5 msec duration; and (3) flames of 1100 C over 50% of the external surface for 30 min. In addition, the data on the DFDR's recording medium remained intact after 24 hours of immersion in aircraft fuel, lubricating oil, and fire extinguishing fluids, and reproducible after 36 hours of immersion in seawater. Post-accident recorder handling and data recovery procedures are also covered. O.C.

A82-17420 **The all-electric airplane - A new trend.** M. J. Cronin (Lockheed-California Co., Burbank, CA). *Lockheed Horizons,* Winter 1981-1982, p. 28-39.

After a brief, historical consideration of the progress of aeronautics and of the feasibility of electrical-propulsion aircraft such as the photovoltaic Solar Challenger, a description is given of the direct operating cost reductions and system efficiencies derived from the replacement of bleed air/hydraulic/pneumatic/electrical aircraft power systems by a single, electric power system. In such a system, electric generators are the sole source of power for such functions as (1) the primary/secondary flight control system; (2) de-icing and anti-icing; (3) environmental controls; (4) electronics and avionics loads; and (5) landing gear actuation and other mechanical functions. Estimates are presented of cycled weight savings and of the power extraction penalties that may be obviated by the all-electric system. The integration of power-by-wire and fly-by-wire systems is also discussed. O.C.

A82-17531 **Tensile fatigue assessment of candidate resins for use in fibre reinforced composite repair schemes.** D. P. Bashford, A. K. Green (Fulmer Research Institute, Ltd., Stoke Poges, Bucks., England), K. F. Rogers, and D. M. Kingston-Lee (Royal Aircraft Establishment, Materials Dept., Farnborough, Hants., England). In: Composite structures; Proceedings of the First International Conference, Paisley, Scotland, September 16-18, 1981.
London, Applied Science Publishers, 1981, p. 556-572. Research supported by the Ministry of Defence (Procurement Executive).

Five matrix resin systems have been evaluated as potential candidates for use in a rapid repair system for aircraft skin damage, incorporating glass/carbon fiber hybrid reinforced plastics as the repair material. Two epoxy and three polyester resin systems were evaluated at 20 C. Additionally, the three polyester systems were evaluated at 0 C. The effect of contamination of metal surfaces by aviation fuel and hydraulic fluid was investigated. The properties measured were metal/composite joint overlap shear strength, as manufactured and following a fixed schedule of tensile fatigue load conditioning, and bending stiffness. These properties were determined 4 h and 24 h after fabricating the simulated repair. The resin system Quickcure QC3/Lucidol CH50/dimethyl-p-toluidine was found to give repairs equal to riveted metal plate repairs under all circumstances except to hydraulic fluid contaminated substrates at 0 C. (Author)

A82-17535 **Stress intensity factor measurements in composite sandwich structures.** I. Roman, H. Harel, and G. Marom (Jerusalem, Hebrew University, Jerusalem, Israel). In: Composite structures; Proceedings of the First International Conference, Paisley, Scotland, September 16-18, 1981. London, Applied Science Publishers, 1981, p. 633-646. 8 refs.

It is pointed out that although LEFM and its fracture criterion - the critical stress intensity factor - have been used in research with composites for quite some time, its applicability is not yet commonly accepted. The study described here seeks to provide an experimental certification of the applicability of the concept to a composite control surface. The structure used is constructed of angle-ply composite skins and a composite honeycomb core. The research is confined to cases of skin damage, such as surface scratches or notches, and seeks to provide a tool for determining when such forms of detectable damage become critical. It is noted that in many cases the fracture process in sandwich structures containing skin surface notches is confined to delamination in the skin at the vicinity of the notch tip; this is ultimately followed by splitting at the adhesive layer between the skin and the core. In such cases, it is possible to calculate the fracture stress of the sandwich structure from the fracture toughness of the skin. The relevant Y value is the one obtained from the new Y polynomials derived for the skin and from the corresponding ratio of notch depth to skin thickness. C.R.

A82-17538 **Effects of elastomeric additives on the mechanical properties of epoxy resin and composite systems.** R. J. Moulton (Hexcel Corp., Dublin, CA) and R. Y. Ting (U.S. Navy, Naval Research Laboratory, Orlando, FL). In: Composite structures; Proceedings of the First International Conference, Paisley, Scotland, September 16-18, 1981. London, Applied Science Publishers, 1981, p. 674-688. 16 refs.

Both the fracture behavior and the mechanical properties balance of fiber-reinforced composites containing a modified resin system are discussed on the basis of the results of an extensive experimental study. A series of acrylonitrile-butadiene modified epoxy polymers is used. Resin fracture energies are determined by using standard compact tension specimens and the Izod impact specimens. The elastomeric modifiers greatly increase the fracture energy of the base epoxy, and the extent of this increase is found to depend on the weight percentage and the molecular weight of the CTBN additives. In addition, post-failure fractography is also carried out to examine the system morphology for the identification of the basic mechanism of toughening. Enhanced toughness is always found to couple with trade-offs in strength and modulus. The results also show that the short beam shear test gives the interlaminar shear strength of the composite sample but not the interlaminar fracture energy. C.R.

A82-17594 * # **Multilevel optimum design of structures with fiber-composite stiffened-panel components.** L. A. Schmit and M. Mehrinfar (California, University, Los Angeles, CA). *(AIAA, ASME, ASCE, and AHS, Structures, Structural Dynamics and Materials Conference, 21st, Seattle, WA, May 12-14, 1980, AIAA Paper 80-0723.) AIAA Journal,* vol. 20, Jan. 1982, p. 138-147. 14 refs. Grant No. NsG-1490.

The multilevel approach to minimum weight structural design is extended to wing box structures with fiber-composite stiffened-panel components. Strength, deflection, and panel buckling constraints are treated at the system level with equivalent-thickness-type design variables. Local buckling and panel buckling constraints are guarded against at the component level, employing detailed component dimensions as design variables. A key feature of the method is selection of change in stiffness as the component level objective function to be minimized. Numerical results are given for wing box structures with sandwich and hat-stiffened fiber-composite panels. (Author)

A82-17962 # **Effect on surface pressure of trapezoidal holes in a T-38 stabilator.** J. C. Westkaemper and R. M. Chandrasekharan (Texas, University, Austin, TX). *Journal of Aircraft,* vol. 19, Jan. 1982, p. 81, 82. USAF-sponsored research.

Subsonic wind tunnel measurements were made of the surface pressure distributions on a T-38 stabilator with four configurations of trapezoidal holes, in a study of the effects of damage on wing and tail aeroelastic characteristics. The effects of the holes on surface pressures were found to follow two patterns, one for attached flow and another for separated flow, depending on the extent of leading-edge separation on the stabilator. At angles of attack of more than 5 deg, with separation, all upper surface pressures were perturbed. O.C.

A82-17963 * # **Propeller tip vortex - A possible contribution to aircraft cabin noise.** B. A. Miller, J. H. Dittmar, and R. J. Jeracki (NASA, Lewis Research Center, Cleveland, OH). *Journal of Aircraft,* vol. 19, Jan. 1982, p. 84-86. 8 refs.

fan bypass ratios, the noise components contributed by nacelles, slats, and flaps at various angles, and the specialized options offered by the modular-structure program. O.C.

A82-18321 **A short history of aviation gasoline development, 1903-1980.** A. R. Ogston. *(Society of Automotive Engineers, West Coast International Meeting, Seattle, WA, Aug. 3-6, 1981.) Aeronautical Journal,* vol. 85, Dec. 1981, p. 441-450. 9 refs.

An historical account is given of the development of gasoline for aircraft engines, in keeping with advances in reciprocating engine design and increasing performance requirements. Consideration is given to the capabilities of the oil refining industry at the time of the Wright brother's first powered flight in 1903, and the dependence between engine performance and fuel chemistry established shortly thereafter by the Wrights and other aviation pioneers. The cracking process, yielding gasolines with superior anti-knock properties, was not invented until 1913, and no official specifications for aviation gasoline existed before the First World War. The first systematic studies of the relation of detonation to fuel quality were made by Harry Ricardo in 1919, using a single-cylinder, variable-compression engine, and the first truly adequate, 100 octane gasolines became available in 1935. The 30% horsepower increase resulting from 100 octane gasoline's use was an essential element of the RAF's victory over the Luftwaffe in the Battle of Britain. The introduction of turboprop and turbojet airliners during the 1950s brought an end to the development of aviation gasoline. O.C.

A82-18322 **Design evolution of the Boeing 757.** P. M. Condit (Boeing Commercial Airplane Co., Renton, WA). *Aeronautical Journal,* vol. 85, Dec. 1981, p. 451-458.

An account is given of the development history of the 757-200 airliner, which is scheduled to enter service in January 1983. Attention is given the degree of structural commonality with the 727 aircraft that the 757 replaces, and the advanced flight management and hydraulic and electrical power systems shared by the 757 and wide-body 767 designs. The 757-200 may be fitted with 25-32% more seats than the 727, and incorporates RB211 engines whose specific fuel consumption is 26-31% lower than those used in the 727-300B program. The all-digital, two-pilot flight deck of the 757 provides flight path/energy management computation and display capabilities unavailable in current airliners, and can in addition display weather radar and optimum climb profiles and cruise altitudes. The energy efficiency gains estimated for the digital avionics are as high as 6%. O.C.

A82-18346 **F101DFE in Tomcat - Preliminary test results.** M. Gaines. *Flight International,* vol. 120, Dec. 19, 1981, p. 1826-1828.

System features and performance of the F101DFE engines in the F-14 Tomcat fighter are described. The two 29,000 lb thrust engines have a bypass ratio of 0.85, the core of the F101, and a scaled-up front end and nozzle from the F404 like in the F-18 Hornet. The engine components are detailed, and it is noted that the F101DFE can cross-start at ground idle. The new engines give a 62% combat radius increase, 34% longer patrol on-station, and 22% more energy for maneuvering. The Super Tomcat can climb at Mach 0.8, 30 deg pitch, with 8,000 lb of fuel and have power left at 40,000 ft, having taken off without afterburners from a carrier deck. The fuel is burned smokelessly, and combat maneuvering tests with F-5s showed that the F-5 pilots were unable to achieve either a gun or missile fix on the F101DFE aircraft, although a reticence to use full dual throttle capability was noted during test pilots' first flights. M.S.K.

A82-18347 **2037 - Pratt & Whitney tests new turbofan.** J. Moxon. *Flight International,* vol. 120, Dec. 19, 1981, p. 1832-1834.

The PW2037 turbofan, earmarked for use on the Boeing 757, is discussed. The engine provides 37,000 lb of thrust, spins 30% faster than the JT9D, and employs powdered metal nickel alloy discs. Other features are a 30:1 pressure ratio, single crystal blades, an inlet temperature of 1385 C, an electron beam welded drum, and digital engine control. Dual redundancy and three levels of self-test and fault isolation are included in the electronics, and active clearance control, abradable tip seals, and increased stiffness and concentricity result in a 2% added fuel efficiency. Flight testing aboard a 747 is scheduled for February 1983, with actual delivery for use on the 757 to begin in 1984. M.S.K.

A82-18348 **Lear Fan - The plastic aeroplane arrives.** R. Whitaker. *Flight International,* vol. 120, Dec. 26, 1981, p. 1896-1901.

The carbon reinforced plastic Lear rear-mounted turboprop aircraft is discussed. The design includes a 15,000 hr/15,000 cycle life, and high-strength areas where aluminum was used are indicated. The Kevlar radome is built to withstand a 4-lb birdstrike at 250 knots airspeed. The airfoils are computer optimized from the NACA 65 series and have Nomex honeycomb cores. A weight of 7200 lb and a wing area of 163 sq ft are mentioned for the Y-tailed plane. Centerline thrust is provided by independent dual engines, which are monitored by a metal chip detector to expand the operating safety margin. The engines have 850 shp and the cruise speed is 311 kt at 40,000 ft. It is noted that the propeller can operate at high Mach speeds and is also made of composites. Full certification is projected for 1983 with the addition of deicers. M.S.K.

A82-18349 **Boeing 757 - Introducing the big-fan narrowbody.** D. Velupillai and F. Munger. *Flight International,* vol. 121, Jan. 2, 1982, p. 12-20.

The Boeing 757, a 180 passenger turbofan powered aircraft intended for short haul airliner service, is described. Intended as a replacement for the 727, the 757 has a narrow-bodied fuselage with seating arranged six abreast, and offers fuel savings of 20% over previous turbofans. Many systems are interchangeable with the 767, and a cruise speed of Mach 0.8 is given for the 155 ft 3 in. long aircraft. Components of the body made of composites and advanced aluminum alloys have achieved significant weight savings and improved strength, in addition to increased range. The plane has a design range of 500 n.m. Emergency equipment is designed to operate automatically for the most part, and it is noted that the cockpit, with CRT displays, is the same cockpit used for the 767. M.S.K.

A82-18412 **Consideration of mechanical, physical, and chemical properties in bearing selection for landing gear of large transport aircraft.** H. E. Fewtrell (Lockheed-California Co., Burbank, CA). *American Society of Lubrication Engineers and American Society of Mechanical Engineers, Lubrication Conference, New Orleans, LA, Oct. 5-7, 1981, ASLE Preprint 81-LC-2B-3.* 4 p. Members, $2.00; nonmembers, $4.00.

A comparison of the performance of aluminum nickel bronze and beryllium copper under test and service conditions demonstrates that mechanical, physical and chemical properties must all be considered in the selection of bearing materials. These properties are related to specific performance requirements for the cases of (1) pin joints lubricated with diester grease and (2) shock strut pistons lubricated with MIL 5606 hydraulic oil, to show that the greater thermal diffusivity of beryllium copper can effectively prevent hot spotting under marginal lubrication conditions. In addition, data are presented which demonstrate how the chemical reactivity of beryllium copper, in the presence of the tricresyle phosphate of MIL 5606 hydraulic oil, can preclude the generation of ladder cracks in large transport landing gear pistons with chrome plating. O.C.

A82-18429 # **Four pad tilting pad bearing design and application for multistage axial compressors.** J. C. Nicholas and R. G. Kirk (Ingersoll-Rand Co., Turbo Machinery Div., Phillipsburg, NJ). *American Society of Mechanical Engineers and American Society of Lubrication Engineers, Joint Lubrication Conference, New Orleans, LA, Oct. 5-7, 1981, ASME Paper 81-Lub-12.* 7 p. 17 refs. Members, $2.00; nonmembers, $4.00.

Advantages of operating multistage axial compressors on 4 pad tilting pad bearings are discussed and compared to other fixed bore and tilting pad bearing designs. Advantages include operation free of subsynchronous vibrations, and placement of peak response speeds outside of the operating speed range with between pilot loading. Three axial groove and step journal bearings have asymmetric stiffness and damping properties, and therefore produce a split or double first critical speed. An axial compressor operating on three axial groove bearings may be subject to oil whirl and/or aerodynamic induced stabilities. Test results are in good agreement with theoretical analyses, and for the cases presented, the 4 pad tilting pad bearing is successful in removing the peak response from the operating speed range. D.L.G.

A82-18435 * # **Effects of ultra-clean and centrifugal filtration on rolling-element bearing life.** S. H. Loewenthal (NASA, Lewis Research Center, Cleveland, OH), D. W. Moyer (Tribon Bearing Co., Cleveland, OH), and W. M. Needelman (Pall Corp., Glen Cove, NY). *American Society of Mechanical Engineers and American Society of Lubrication Engineers, Joint Lubrication Conference, New Orleans, LA, Oct. 5-7, 1981, ASME Paper 81-Lub-35.* 9 p. 20 refs. Members, $2.00; nonmembers, $4.00.

Fatigue tests were conducted on groups of 65-mm bore diameter deep-groove ball bearings in a MIL-L-23699 lubricant under two levels of filtration to determine the upper limit in bearing life under the strictest possible lubricant cleanliness conditions. Bearing fatigue lives, surface distress and weight loss were compared to previous bearing fatigue tests in contaminated and noncontaminated oil filters having absolute removal ratings of 3, 30, 49, and 105 microns, with lubricant and sump temperatures maintained at 347 K. Ultra clean lubrication was found to produce bearing fatigue lives that were approximately twice that obtained in previous tests with contaminated oil using 3 micron absolute filtration. It was also observed that the centrifugal oil filter has the same effectiveness as a 30 micron absolute filter in preventing surface damage. D.L.G.

A82-18444 # **Inclusions and service induced cracks in a mature population of gas turbine engine bearings.** J. R. Barton, F. N. Kusenberger, and B. B. Baber (Southwest Research Institute, San Antonio, TX). *American Society of Mechanical Engineers and American Society of Lubrication Engineers, Joint Lubrication Conference, New Orleans, LA, Oct. 5-7, 1981, ASME Paper 81-Lub-48.* 9 p. 34 refs. Members, $2.00; nonmembers, $4.00. Contract No. F09603-74-C-5158.

The automated bearing inspection system called Critical Inspection of Bearings for Life Extension (CIBLE) was used to process NDE data acquired on approximately 1000 main shaft bearings used in the J57/TF33 gas turbine engine. Bearing service ranged from zero to about 13,000 hours, and both inclusions and service-induced cracks had been detected in a number of their components. In light of endurance testing that was conducted in addition to the metallurgical sectioning and scanning electron microscope investigations used in correlation analyses, a linear extrapolation of the total service population of the number 2 bearing position of the engine leads to the forecast of over 200 cracked bearings in the fleet of B52, KC135, C141, and E3A aircraft in which the J57/TF33 is installed. O.C.

A82-18452 # **Design and testing of a new double labyrinth seal.** J. S. Wyler (General Electric Co., Aircraft Instruments Dept., Wilmington, MA). *American Society of Mechanical Engineers and American Society of Lubrication Engineers, Joint Lubrication Conference, New Orleans, LA, Oct. 5-7, 1981, ASME Paper 81-Lub-58.* 6 p. 10 refs. Members, $2.00; nonmembers, $4.00.

A labyrinth seal that increases the fluid loss or fluid resistance through the leakage gap is presented. The design includes an inner member which can be slid axially into the outer member without interference. Losses are generated by the double labyrinth effect, and an analysis of loss measurement parameters is provided. Testing with a weight stand with JP4 jet fuel is described for the pressure drop across the seal. The results are noted to eliminate certain labyrinth designs from consideration for seal designs in a laminar region. The double labyrinth seal is, however, judged to be more effective than an equivalent annulus, although further tests on rotation are needed. Application of the results for improvements in the accuracy of fluid drive type angular momentum flowmeters are indicated. M.S.K.

A82-18479 † **Damage of turbine blades due to interaction with fuel resinification products (Razrushenie rabochikh lopatok turbiny v usloviiakh vzaimodeistviia s produktami osmoleniia topliva).** G. P. Pimenova, O. I. Marueli, I. A. Makovetskaia, and B. A. Griaznov (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR). *Problemy Prochnosti,* Dec. 1981, p. 27-32. 5 refs. In Russian.

The sulfide corrosion damage of the rotor blades of aircraft and stationary gas turbine engines have been studied after actual operation. Conditions leading to the formation of a corrosion layer containing films of nickel-nickel sulfide eutectics (35% S and 65% Ni) on ZhS6kp and EI826 alloy blading are identified. It is shown that such a layer reduces the fatigue strength of the blades by 60%. V.L.

A82-18484 † **Effect of the blading type on the aerodynamic damping of blade vibrations with allowance for the profile curvature (K voprosu o vliianii tipa reshetki na aerodinamicheskoe dempfirovanie kolebanii lopatok s uchetom krivizny profilei).** N. Iu. Nesterko (Akademiia Nauk SSSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR). *Problemy Prochnosti,* Dec. 1981, p. 68-70. 7 refs. In Russian.

The aerodynamic damping of blade vibrations has been studied experimentally as a function of the blading type, blade stagger angle, and blade curvature. It is shown that the effect of the adjacent blades on one another depends on the blading type and blade curvature. Experimental results are found to be in good qualitative agreement with the known theoretical studies; the quantitative deviation does not exceed 30-40%. V.L.

A82-18576 † **A mathematical model of a subsonic transport aircraft (O matematicheskoi modeli dozvukovogo transportnogo samoleta).** A. F. Latypov and B. N. Soroka (Akademiia Nauk SSSR, Institut Teoreticheskoi i Prikladnoi Mekhaniki, Novosibirsk, USSR). *Akademiia Nauk SSSR, Sibirskoe Otdelenie, Izvestiia, Seriia Tekhnicheskikh Nauk,* Oct. 1981, p. 83-88. In Russian.

A mathematical model of a subsonic turbojet-engine transport aircraft is developed which is based on the representation of the aerodynamic polar curve and the engine throttling characteristic in the form of generalized relationships. Also included are the necessary conditions for maximum flight range. Dimensionless parameters are incorporated into the model which reflect the characteristics of the airframe and power plant and make it possible to vary the optimum lift-drag ratio of the airframe and the thermodynamic efficiency of the power plant within wide limits. Examples are included of calculations carried out to determine the optimum dimensions of the power plant and to assess the effect of the dimensionless parameters on the aircraft's characteristics. C.R.

A82-18583 † **Determination of the trimmed drag of an aircraft (Opredelenie balansirovochnogo aerodinamicheskogo soprotivleniia samoleta).** V. A. Barinov and A. G. Obrubov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 78-84. 5 refs. In Russian.

It is shown that rake angles of flow from the wing near the horizontal tail surface calculated by the Glauert method agree well with experimentally measured angles. Formulas for calculating the drag of the horizontal tail surface are presented. An analysis is presented of the influence of the longitudinal static stability margin and longitudinal moment coefficient (at zero lift) on the lift-drag ratio under trim conditions. B.J.

A82-18584 † **Game-theoretical method for the synthesis of aircraft control during landing approach (Igrovoi podkhod k zadache sinteza upravleniia samoletom pri zakhode na posadku).** I. N. Titovskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 85-92. In Russian.

The theory of differential games is used to consider the control of a nonmaneuvering aircraft in a longitudinal channel on a glide descent path under wind disturbances. An optimal control algorithm is obtained that ensures minimum deviation of the aircraft from glide, with allowance for constraints on the speed of control-surface reversal. Numerical results are presented. B.J.

A82-18586 † **Investigation of the stress-strain state of a rectangular wing section of variable thickness under concentrated loads and heating (Issledovanie napriazhenno-deformirovannogo priamougol'nogo kessona peremennoi tolshchiny pri sosredotochennykh nagruzkakh i nagreve).** S. N. Bulatov and P. N. Kurochka. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 121-128. In Russian.

The Lagrange principle of virtual displacements is used to obtain a system of differential equations with variable coefficients. The solution of this system is used to determine the displacements of the arbitrary cross-section contour of a rectangular wing section under concentrated loads and an inhomogeneous temperature field. Displacements of contour points caused by warping are determined from the inhomogeneous Bessel equations. Computational results are presented. B.J.

A82-18589 † **Concerning the calculation of the aerodynamic characteristics of mechanized wings (K raschetu aerodinamicheskikh kharakteristik mekhanizirovannykh kryl'ev).** V. S. Savin. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 129-133. In Russian.

analysis techniques to the design of high lift sections for flight conditions were determined and two high lift sections were designed to flight conditions. The influence of the high lift section on the sizing and economics of a specific energy efficient transport (EET) was clarified using a computerized sizing technique and an existing advanced airplane design data base. The impact of the best design resulting from the design applications studies on EET sizing and economics were evaluated. Flap technology trade studies, climb and descent studies, and augmented stability studies are included along with a description of the baseline high lift system geometry, a calculation of lift and pitching moment when separation is present, and an inverse boundary layer technique for pressure distribution synthesis and optimization. A.R.H.

N82-15019*# Boeing Commercial Airplane Co., Seattle, Wash. Preliminary Design Dept.
NATURAL LAMINAR FLOW AIRFOIL ANALYSIS AND TRADE STUDIES Final Report, Aug. 1977 - Jun. 1978
May 1979 86 p refs
(Contract NAS1-14742)
(NASA-CR-159029; B-7220) Avail: NTIS HC A05/MF A01 CSCL 01A

An analysis of an airfoil for a large commercial transport cruising at Mach 0.8 and the use of advanced computer techniques to perform the analysis are described. Incorporation of the airfoil into a natural laminar flow transport configuration is addressed and a comparison of fuel requirements and operating costs between the natural laminar flow transport and an equivalent turbulent flow transport is addressed. Author

N82-15025*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NASA AVIATION SAFETY REPORTING SYSTEM Quarterly Report
Sep. 1981 57 p refs Prepared in cooperation with Battelle Columbus Labs., Mountain View, Calif.
(NASA-TM-81274; A-8504; QR-13) Avail: NTIS HC A04/MF A01 CSCL 01C

Aviation safety reports that relate to loss of control in flight, problems that occur as a result of similar sounding alphanumerics, and pilot incapacitation are presented. Problems related to the go around maneuver in air carrier operations, and bulletins (and FAA responses to them) that pertain to air traffic control systems and procedures are included. S.L.

N82-15026# Research Inst. of National Defence, Linkoeping (Sweden). Huvudavdelning 3.
DETECTION OF OBSTACLES BY LOW FLYING AIRCRAFT
Dietmar Letalick Aug. 1981 42 p refs
(FOA-C-30227-E1) Avail: NTIS HC A03/MF A01

A model which calculates reflection from cylindrical obstacle surfaces, e.g., power cables is presented. Measurements of reflection of 10.6 micron radiation from various types of wires, cables and framework are reported. The measurements were performed in the laboratory using a CO2 laser and direct detection, with the targets a few meters away. Detection at distances of 500 and 1100 m using a coherent laser was also performed. Calculations of detection range for typical situations indicate that detection at km distances is possible. Author (ESA)

N82-15027*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.
AUTOMATED PILOT ADVISORY SYSTEM Final Report
John L. Parks, Jr. and James G. Haidt (Research Triangle Inst., N.C.) Nov. 1981 184 p refs
(NASA-TM-73296) Avail: NTIS HC A09/MF A01 CSCL 17G

An Automated Pilot Advisory System (APAS) was developed and operationally tested to demonstrate the concept that low cost automated systems can provide air traffic and aviation weather advisory information at high density uncontrolled airports. The system was designed to enhance the see and be seen rule of flight, and pilots who used the system preferred it over the self announcement system presently used at uncontrolled airports. S.L.

N82-15028# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abt. Flugzeugsteuerung und -regelung.
ANALYSIS OF TWO AIR TRAFFIC SAMPLES IN THE TERMINAL AREA OF FRANKFURT AM MAIN, 3 AUGUST 1979
Manfred Schubert and Uwe Voelckers Jun. 1981 119 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-740)
(DFVLR-Mitt-81-17; ESA-TT-740) Avail: NTIS HC A06/MF A01; DFVLR, Cologne DM 26,50

The random deviation of air traffic arrivals in the terminal area, the different structure of standard arrival routes and a multitude of operational procedures affect the overall planning of arrival traffic. The necessary time-balance between arrivals can be established partly by coordination between approach control and enroute controller and by flight path planning within the terminal area. The effect of the applied control procedures on arrival distributions, traffic handling, traffic sequence, and traffic density in the terminal area are analyzed for the recorded air traffic periods on August 3rd, 1979. The findings are discussed in comparison with the results of a proceeding analysis of approach traffic on August 4th, 1978. Author

N82-15029# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Arteilung flugzeugsteuerung und -regelung.
ANALYSIS OF TWO AIR TRAFFIC SAMPLES IN THE TERMINAL AREA OF FRANKFURT AM MAIN, 4 AUGUST 1978
Uwe Voelckers, Manfred Schubert, and Albrecht Seyfried Jun. 1981 128 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-739)
(DFVLR-Mitt-81-12; ESA-TT-739) Avail: NTIS HC A07/MF A01; DFVLR, Cologne DM 28

Two 'arrival peaks' in the near terminal area of Frankfurt/Main were analyzed. Extensive computer-programs were used to combine the recorded data from seven different data-sources. The traffic analysis includes the quantitative evaluation of traffic density, studies of air traffic distributions relating to space and time, the investigation of air traffic control procedures, the determination of the approach control planning strategies and a basic investigation of traffic vectoring in the terminal area. The two traffic samples are discussed and compared. A.R.H.

N82-15030*# Boeing Vertol Co., Philadelphia, Pa.
XV-15 TILT ROTOR FLY-BY-WIRE COLLECTIVE CONTROL DEMONSTRATOR DEVELOPMENT SPECIFICATIONS Final Report, Mar. 1981
R. J. Meuleners Mar. 1981 34 p
(Contract NAS2-10160)
(NASA-CR-166262; D210-11819-1) Avail: NTIS HC A03/MF A01 CSCL 01C

A fly by wire system in the collective control system for XV-15 Tilt Rotor Research Aircraft was evaluated. The collective control system was selected because it requires a system tracking accuracy between right and left rotors of approximately 0.1%. The performance characteristics of the collectors axel provide typical axis control response data. The demonstrator is bread boarded as a dual system instead of the triplex system. E.A.K.

N82-15031*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
A THEORETICAL INVESTIGATION OF WING ROCKING Semiannual Status Report, 1 Jul. - 31 Dec. 1981
C. Edward Lan and Chung-Hao Hsu 31 Dec. 1981 36 p refs
(Contract NAG1-134)
(NASA-CR-165058) Avail: NTIS HC A03/MF A01 CSCL 01A

A semiempirical method to predict vortex breakdown effects on aerodynamic characteristics of slender wings is described. The method is based on Polhamus' method of suction analogy. Both longitudinal and lateral directional characteristics are predicted. S.L.

N82-15032*# Connecticut Univ., Storrs.
STOCHASTIC CONTROL AND IDENTIFICATION OF HELICOPTER DYNAMIC MODES Semiannual Progress Report, 1 Jul. - 31 Dec. 1981
J. Molusis and Y. Bar-Shalom Dec. 1981 35 p refs
(Grant NAG2-72)

(NASA-CR-166057) Avail: NTIS HC A03/MF A01 CSCL 01C

Simulations of ground resonance model with constant and periodic coefficient measurement models were made. The extended Kalman filters, as an identification method, and it's convergence properties were reviewed. Free response data for identification of damping for ground resonance was used and the ground resonance parameter identification results for constant coefficient and periodic coefficient measurement models are presented. S.L.

N82-15033*# Boeing Co., Seattle, Wash.
SELECTED ADVANCED AERODYNAMIC AND ACTIVE CONTROL CONCEPTS DEVELOPMENT Summary Report, 10 Aug. 1977 - 9 Aug. 1979
Washington, D.C. NASA Jan. 1980 56 p refs
(Contract NAS1-14742)
(NASA-CR-3220; D6-46705) Avail: NTIS HC A04/MF A01 CSCL 01C

A summary is presented of results obtained during analysis, design and test activities on six selected technical tasks directed at exploratory improvement of fuel efficiency for new and derivative transports. The work included investigations into the potential offered by natural laminar flow, improved surface coatings and advanced high lift concepts. Similar investigations covering optimum low-energy flight path control, integrated application of active controls and evaluation of primary flight control systems reliability and maintenance are also summarized. Recommendations are included for future work needed to exploit potential advancements. Author

N82-15034*# Boeing Commercial Airplane Co., Seattle, Wash.
DEVELOPMENT OF INTEGRATED PROGRAMS FOR AEROSPACE-VEHICLE DESIGN (IPAD) - IPAD USER REQUIREMENTS Final Report
G. L. Anderton Mar. 1979 103 p
(Contract NAS1-14700)
(NASA-CR-2985; D6-IPAD-70013-D) Avail: NTIS HC A06/MF A01 CSCL 01C

Results of a requirements analysis task for Integrated Programs for Aerospace Vehicle Design (IPAD) are presented. User requirements which, in part, will shape the IPAD system design are given. Requirements considered were: generation, modification, storage, retrieval, communication, reporting, and protection of information. Data manipulation and controls on the system and the information were also considered. Specific needs relative to the product design process are also discussed. M.D.K.

N82-15036# Textron Bell Helicopter, Fort Worth, Tex.
HELICOPTER LANDING GEAR DESIGN AND TEST CRITERIA INVESTIGATION Final Report
David Crist and L. H. Symes Aug. 1981 192 p refs
(Contract DAAK51-79-C-0011; DA Proj. 1L1-62209-AH-76)
(AD-A105512; BHT-699-099-026; USAAVRADCOM-TR-81-D-15) Avail: NTIS HC A09/MF A01 CSCL 01/3

This program was an investigation of the criteria relating to helicopter landing gears. A computerized literature search was conducted and a bibliography is included in this report. Existing criteria were reviewed and conflicts were identified. An analysis of survivable Army helicopter accidents was performed. The results were used to formulate a tentative criterion. A design study was conducted to evaluate the practicality of the tentative criteria. This investigation compared wheel and skid-type landing gears designed to the tentative criteria and to MIL-S-8698. A crashworthiness analysis of the tentative criteria tailwheel tricycle gear was performed. Weights and landing loads were calculated. A cost comparison was made between tailwheel tricycle gears designed to the two criteria. The gear designed to the new criteria was cost-effective. The results of the investigation were used to modify the tentative criteria and recommendations were made for a new helicopter landing gear military specification and for changes to the existing criteria. Author (GRA)

N82-15037# Vereinigte Flugtechnische Werke-Fokker G.m.b.H., Bremen (West Germany).
ESTIMATION METHODS FOR THE DETERMINATION OF DYNAMIC RESPONSES OF ELASTIC AIRCRAFT
S. Vogel Bonn Bundesministerium der Verteidigung 1981 123 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-81-6) Avail: NTIS HC A06/MF A01; DOKZENTBw, Bonn DM 40

A method for establishing the dynamic response of an elastic aircraft structure to external excitation, such as random gusts or arbitrarily timed maneuver loads is presented. The solution is based on an analytic representation of the admittance functions by partial fractions. The time response frequency dependence of the aerodynamic forces induced by motion are approximated to allow analytical solutions which are shown to be as accurate, but more economical, than more elaborate numerical Fourier methods. Elasticity is introduced through eigenfrequencies and generalized masses. Several examples are shown which also include the influence of control systems and of elasticity on loads and accelerations. Depending on the quality of the structural and aerodynamical input, the method may be used as an estimation method or as an inexpensive approximation method for all dynamic problems in which elasticity, control systems and excitation time lag effects play a role. Author (ESA)

N82-15038# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Flugzeugsteuerung und -regelung.
INTEGRATION OF A DIGITAL AIR DATA COMPUTER INTO THE TEST AIRCRAFT HFB-320
Rainer Dombrowsky and Vollmar Adam May 1981 62 p refs In GERMAN; ENGLISH summary
(DFVLR-Mitt-81-09) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 16

The digital air data computer HG 280 D5 is presented with its essential characteristics, output signals, and failure test facilities. Integration with the measuring equipment of the test aircraft HFB 320 as well as the hard and software developed for the signal interface of the onboard computer are described. The system processes flight data, such as rate of climb and descent, and altitude. Author (ESA)

N82-15039*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER PROGRAM FOR AERODYNAMIC AND BLADING DESIGN OF MULTISTAGE AXIAL-FLOW COMPRESSORS
James E. Crouse and William T. Gorrell Dec. 1981 106 p refs Prepared in cooperation with Army Aviation Research and Development Command, St. Louis, Mo.
(NASA-TP-1946; AVRADCOM-TR-80-C-21; E-280) Avail: NTIS HC A06/MF A01 CSCL 21E

A code for computing the aerodynamic design of a multistage axial-flow compressor and, if desired, the associated blading geometry input for internal flow analysis codes is presented. Compressible flow, which is assumed to be steady and axisymmetric, is the basis for a two-dimensional solution in the meridional plane with viscous effects modeled by pressure loss coefficients and boundary layer blockage. The radial equation of motion and the continuity equation are solved with the streamline curvature method on calculation stations outside the blade rows. The annulus profile, mass flow, pressure ratio, and rotative speed are input. A number of other input parameters specify and control the blade row aerodynamics and geometry. In particular, blade element centerlines and thicknesses can be specified with fourth degree polynomials for two segments. The output includes a detailed aerodynamic solution and, if desired, blading coordinates that can be used for internal flow analysis codes. Author

N82-15040*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF FUEL INJECTOR TYPE ON PERFORMANCE AND EMISSIONS OF REVERSE-FLOW COMBUSTOR
Carl T. Norgren and Stephen M. Riddlebaugh Dec. 1981 40 p refs
(NASA-TP-1945; E-558) Avail: NTIS HC A03/MF A01 CSCL 21E

The combustion process in a reverse-flow combustor suitable for a small gas turbine engine was investigated to evaluate the effect of fuel injector type on performance and emissions. Fuel injector configurations using pressure-atomizing, spill-flow, air blast, and air-assist techniques were compared and evaluated on the basis of performance obtained in a full-scale experimental combustor operated at inlet conditions corresponding to takeoff, cruise, low power, and idle and typical of a 16:1-pressure-ratio turbine engine. Major differences in combustor performance and

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Wind tunnel model tests support the hypothesis that a propeller tip vortex may subject a downstream wing surface to greater excitation than would be experienced by the aircraft fuselage side wall exposed to propeller-generated noise, ultimately transmitting this structural response to incident dynamic pressure to the cabin interior. Even if structure-borne excitations are less efficient than airborne excitations in the creation of cabin noise, the higher level of the former could still govern cabin noise levels. O.C.

A82-17604 # **Estimate of human control over mid-air collisions.** J. N. Anno (Research Dynamics, Inc., Cincinnati, OH). *Journal of Aircraft*, vol. 19, Jan. 1982, p. 86-88. 5 refs.

A comparison between random collision theoretical predictions and actual cases shows that while human control is very effective in air-carrier mid-air collision accidents, it is relatively ineffective in general aviation. This discrepancy may be due to traffic control, pilot training, or instrumentation. The greatest weakness of the analysis presented is the arbitrary choice of representative aircraft for the two groups considered. A more detailed analysis for general aviation aircraft is called for. O.C.

A82-17605 # **Subsonic flow over airborne optical turrets.** A. J. Laderman (Ford Aerospace and Communications Corp., Newport Beach, CA) and R. de Jonckheere (USAF, Weapons Laboratory, Kirtland AFB, NM). *Journal of Aircraft*, vol. 19, Jan. 1982, p. 88-90. 6 refs. Contract No. F2960-79-C-0010.

It is shown that a good estimate of the pressure coefficient distribution of an airborne optical turret can be provided by means of an incompressible, inviscid code, which succeeds in (1) rationalizing the results of wind tunnel test measurements and (2) accounts for the effects of turret configuration. Compressibility effects are found to be small for the freestream Mach number range considered, but an improved agreement between data and analysis is obtained by using the code in conjunction with the compressibility correction proposed. O.C.

A82-17606 # **ADEN plume flow properties for infrared analysis.** C.-W. Chu and J. Der, Jr. (Northrop Corp., Aircraft Div., Hawthorne, CA). *Journal of Aircraft*, vol. 19, Jan. 1982, p. 90-92. 5 refs.

A simple modeling technique is described for the prediction of two-dimensional nozzle plume properties in IR signature analyses. Attention is given models for converging-diverging nozzles, augmented deflecting exhaust nozzles, and two-dimensional plug nozzles with and without bypass flow and/or engine swirl. A 10-deg engine swirl was found to reduce predicted plume temperature to the extent that, although swirl is undesirable from the point of view of performance, it must be recommended for two-dimensional nozzle plume IR signature reduction. O.C.

A82-17607 # **Take-off ground roll of propeller driven aircraft.** R. J. Hawks (Tri-State University, Angola, IN). *Journal of Aircraft*, vol. 19, Jan. 1982, p. 92, 93. 5 refs.

The solution to the acceleration problem for constant power with aerodynamic drag, including lift, developed by Hawks and Sayre (1973) is applied to the take-off ground roll problem in propeller driven aircraft. The major difficulty with the constant power calculation is that the static thrust has to be infinite in order for true constant power to be maintained. The problem is avoided by treating thrust as constant at the static thrust value up to the speed where the static thrust would produce the rated thrust-power, and then treating the power as constant above that speed. O.C.

A82-17608 # **Kelvin-Helmholtz stability analysis of air cushion landing gear trunk flutter.** M. Hinchey and P. Sullivan (Toronto, University, Toronto, Ontario, Canada). *Journal of Aircraft*, vol. 19, Jan. 1982, p. 94-96. Research supported by the Natural Sciences and Engineering Research Council of Canada.

It is shown that a Kelvin-Helmholtz linear stability analysis, similar to those used for aeroelastic problems such as panel flutter, predicts a divergent oscillation at the conditions for which flutter was observed during the development of bag or trunk-type air cushion landing gear. The flutter is therefore not neccessarily the result of a static instability, as suggested by Boghani and Fish (1979). The trunk is modeled locally as a membrane of infinite extent, set parallel to the ground plane. O.C.

A82-17714 * **Calculations of lightning return stroke electric and magnetic fields above ground.** M. J. Master, M. A. Uman, Y. T. Ling, and R. B. Standler (Florida, University, Gainesville, FL). *Journal of Geophysical Research*, vol. 86, Dec. 20, 1981, p. 12127-12132. 16 refs. NSF Grant No. ATM-79-02627; Grant No. NGR-10-005-169; Contracts No. N00014-81-K-0177; No. F33615-79-C-3412.

Lin et al., (1980) presented a lightning return stroke model with which return stroke electric and magnetic fields measured at ground level could be reproduced. This model and a modified version of it, in which the initial current peak decays with height above ground, are used to compute waveforms for altitudes from 0-10 km and at ranges of 20 m to 10 km. Both the original and modified models gave accurate predictions of measured ground-based fields. The use of the calculated fields in calibrating airborne field measurements from simultaneous ground and airborne data is discussed. J.F.

A82-17733 # **Mesoscale convective weather systems and aviation operations.** R. A. Maddox and J. M. Fritsch (NOAA, Office of Weather Research and Modification, Boulder, CO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0015*. 9 p. 10 refs.

Enhanced, infrared satellite imagery is used to reveal that meso-alpha scale convective weather systems often develop and move across the central and eastern United States. The convectively driven weather systems are called mesoscale convective complexes (MCC), and are accompanied by a variety of weather phenomena. A comparison is made of 200 mb winds with numerical forecasts, which indicates that MCCs produce large changes in the airflow within atmospheric layers heavily traversed by commercial aircraft. Examples of MCCs and their impact on aircraft operations and actual flights are also discussed. D.L.G.

A82-17734 # **The Joint Airport Weather Studies project.** J. McCarthy, J. W. Wilson (National Center for Atmospheric Research, Boulder, CO), and T. T. Fujita (Chicago, University, Chicago, IL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0017*. 9 p. 19 refs.

Convective microburst events are analyzed and objectives of the summer, 1982 Joint Airport Weather Studies (JAWS) project are outlined. Microbursts occur on a horizontal scale of 1-4 km (misoscale), and comprise small, strong downdrafts, which cause outflows at ground level resulting in winds exceeding 40 mph. A continued outflow may lead to a gust front, a feature present in squall lines. JAWS facilities include three Doppler radars, two research aircraft, three rawinsonde units, a lightning detection system, and the Portable Automated Mesonet. High resolution data on downdrafts will provide four-dimensional details of dynamic forcing mechanisms of microbursts for modelling such events in computer simulations. The modelling will further serve for understanding the behavior of aircraft in a wind shear environment and determining the causes of microburst events. M.S.K.

A82-17735 * # **Computation of the steady viscous flow over a tri-element 'augmentor wing' airfoil.** T. A. Lasinski, A. E. Andrews, R. L. Sorenson, D. S. Chaussee, T. H. Pulliam, and P. Kutler (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0021*. 16 p. 14 refs.

The augmentor wing consists of a main airfoil with a slotted trailing edge for blowing, and two smaller aft airfoils which shroud the jet. This configuration has been modeled for numerical simulation by a novel discretization procedure which generates four separate grids: three surface-oriented airfoil grids and one outer free-stream grid. Grid lines and slopes are continuous across boundaries, so grid overlap at common boundaries provides boundary information without interpolation. A two-dimensional unsteady thin-layer Navier-Stokes code is used to calculate the flow for the no-blowing case at freestream Mach number = 0.7, Re = 12,600.000, and angles-of-incidence = 1.05 deg. Qualitative agreement with experimental data indicates the utility of this procedure in the analysis of multi-element configurations. (Author)

A82-17753 * # **Screech suppression in supersonic jets.** T. D. Norum (NASA, Langley Research Center, Hampton, VA). *American*

Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0050. 9 p. 12 refs.

Jet screech from underexpanded sonic nozzles has been investigated experimentally. Multiple screech modes, or stages, are found to be present at some jet operating conditions. The fundamental screech tone of each mode attains a maximum amplitude at about 20 deg from the inlet axis, with higher harmonics exhibiting multiple lobes. The directivity of each harmonic is predicted quite well from a stationary array of acoustic monopoles, with phasing between consecutive monopoles determined by the shock cell spacing and eddy convection velocity. Large reduction of screech amplitude can be obtained from modifications to the nozzle exit, although the extent of this suppression is mode dependent. (Author)

A82-17785 # **Wind tunnel investigations for the flat spin of slender bodies at high angles of attack.** H. Kubota, I. Arai, and M. Matsuzaka (Tokyo, University, Tokyo, Japan). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0054.* 12 p. 16 refs. Research supported by the Ministry of Education of Japan.

Low speed wind tunnel investigations for the flat spin of slender bodies at high angles of attack at Reynolds number of 120,000-440,000 are conducted. Effects of geometrical configuration of model, free stream Reynolds number and angle of attack on the flat spin motion are studied with spin rate measurement, associated in situ surface pressure distribution and static side force measurements. It is verified that the occurrence of the flat spin is caused by the difference of flow separation patterns near the critical Reynolds number region. The flat spin motion can be alleviated by making turbulent separation with the use of surface roughness. (Author)

A82-17788 * # **A simple finite difference procedure for the vortex controlled diffuser.** A. A. Busnaina and D. G. Lilley (Oklahoma State University, Stillwater, OK). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0109.* 9 p. 21 refs. USAF-supported research; Grant No. NAG3-74.

A simple prediction procedure for sudden expansion incompressible flows is developed and applied to the vortex controlled diffuser. Transient Navier-Stokes equations of an incompressible fluid are solved by means of their associated finite difference equations in terms of the primitive pressure velocity variables. A computer code is developed using a laminar flow simulation with free slip or no slip wall boundary conditions. In addition, predicted results confirm that effectiveness increases with increases in duct length and bleed flow rate. D.L.G.

A82-17791 # **Widely-spaced co-axial jet, diffusion-flame combustor - Isothermal flow calculations using the two-equation turbulence model.** G. J. Sturgess and S. A. Syed (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0113.* 13 p. 20 refs.

A numerical simulation of the isothermal flow in the Wright Aeronautical Propulsion Laboratory diffusion-flame research combustor is carried out. An axisymmetric finite difference solution of the time-averaged, steady-state, elliptic form of the Reynolds equations is used with closure provided by a two-equation turbulence model. Although the simulation gives acceptable agreement with experimental data in many respects, it is deficient in predicting the recovery rate of a central near-wake region. Several possible explanations for this failure are explored and it is hypothesized that the most probable cause is an inability in the turbulence model to account for the effects on Reynolds stresses of streamwise curvature of the streamlines. (Author)

A82-17793 * # **An iterative finite element-integral technique for predicting sound radiation from turbofan inlets in steady flight.** S. J. Horowitz, R. K. Sigman, and B. T. Zinn (Georgia Institute of Technology, Atlanta, GA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0124.* 9 p. 23 refs. Grant No. NsG-3036.

A new iterative solution technique for predicting the sound field radiated from a turbofan inlet in steady flight is presented. The sound field is divided into two regions: the sound field within and near the inlet which is computed using the finite element method and the radiation field beyond the inlet which is calculated using an integral solution technique. A continuous solution is obtained by matching the finite element and integral solutions at the interface between the two regions. The applicability of the iterative technique is demonstrated by comparison of experimental results with the theoretical results for several different inlet configurations with and without flow. These examples show that good agreement between experiment and theory is obtained within five iterations. (Author)

A82-17796 # **Unsteady flow patterns associated with spoiler control devices.** A. Ayoub, B. Satyanarayana, K. Karamcheti (Stanford University, Stanford, CA), and H. C. Seetharam (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0127.* 9 p.

The unsteady flow field past a Boeing research airfoil fitted with a spoiler has been examined using surface pressure measurements as well as a limited number of velocity measurements in and outside the boundary layer. Definite flow patterns associated with the process of vortex shedding were sought in an effort to establish some correlation with the performance of the spoiler as a lift control device. The flow patterns were found to be complex and not easily reconcilable with known notions about the flow in general. The flow details at two different Reynolds numbers (based on the chord), 2.62 x 10 to the 5th and 5.18 x 10 to the 5th, and three spoiler deflection angles are presented and discussed. (Author)

A82-17799 # **Trailing edge flap influence on leading edge vortex flap aerodynamics.** J. F. Marchman, III and A. C. Grantz (Virginia Polytechnic Institute and State University, Blacksburg, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0128.* 7 p. 6 refs.

A study was conducted to explore the effects of trailing edge flaps (TEF) on leading edge vortex flap (LEVF) aerodynamics. A variety of LEVF and TEF configurations were tested on flat plate delta wings with leading edge sweep angles of 60 and 75 degrees. Results indicated that the well established vortex flowfield of the 75 degree wing was not substantially improved due to the deflection of trailing edge flaps. Significant changes were seen to occur to the marginal vortices of the 60 degree wing. For the 60 degree wing with inverted constant chord LEVFs the deflection of TEFs resulted in substantial increases in life coefficient at low angles of attack without sacrificing other performance parameters. Also shown was the capability for eliminating the adverse longitudinal characteristics of constant chord LEVFs. (Author)

A82-17800 # **Optimal subsonic diffuser wall design for arbitrary entry conditions.** J. L. Livesey and M. Hersel (Salford, University, Salford, Lancs., England). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0132.* 6 p.

Pressure gain in diffusers is basically limited by the flow separation. It is possible theoretically to determine the design of a diffuser with the limiting condition of flow separation occurring throughout. The cross-sectional variation as a function of location in the diffuser, in order to achieve optimal pressure gain, is thus determinable. An attempt has been made to predict, through an integral boundary layer method, the shape of a diffuser with optimal pressure gain. The entry condition is quite general (Reynolds number, Mach number, profile shape, momentum thickness and turbulence). The optimization in the present model is based on the assumption of constant profile shape (Hsep) and zero skin friction. The general effects of each individual entry parameter on the final design shape are discussed, and the general indications are that the pressure recovery of the present optimal diffusers are higher than those of conical diffusers of the same area ratios and that conical diffusers are comparable to the optimal shapes for high inlet Mach numbers. (Author)

A82-17814 # **Computational treatment of transonic canard-wing interactions.** V. Shankar and N. Malmuth (Rockwell International Science Center, Thousand Oaks, CA). *American Institute of*

The numerical method of discrete vortices is used for a comparative analysis of some results on the total and distributed aerodynamic characteristics of thin wings with control surfaces. Attention is given to the solution of the problem in the linear formulation and to the solution of the problem with allowance for the spatial distribution of vortices. B.J.

A82-18590 † **Calculation of the unsteady loads on the surface of a moving wedge with an incident shock wave (Raschet nestatsionarnykh nagruzok, deistvuiushchikh na poverkhnost' dvizhushchegosia klina pri padenii na nego udarnoi volny).** R. Ia. Tugazakov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 134-138. In Russian.

The maximum pressure on the surface of a moving wedge with an incident shock wave is calculated. Pressure on the body is determined as a function of the intensity of the incident wave and the angle of incidence when the intensity of the bow wave is equal to that of the incident wave. Hypersonic small-perturbation theory is used to study the influence of the contact discontinuity on the pressure distribution on the wedge surface. A decrease in the adiabatic exponent leads to an intensification of the unsteady effects. B.J.

A82-18591 † **The effect of the cooling of the wing surface on laminar-to-turbulent boundary layer transition at supersonic flow velocities (Vliianie okhlazhdeniia poverkhnosti kryla na perekhod laminarnogo pogranichnogo sloia v turbulentnyi pri sverkhzvukovykh skorostiakh potoka).** V. A. Kuz'minskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 139-144. In Russian.

The influence of the cooling of a straight-wing model on the laminar-to-turbulent boundary layer transition was studied in a wind tunnel at Mach numbers of 1.8, 2.0, and 2.5, and Reynolds numbers (for one meter of length) in the ranges (11.7-16.9) x 10 to the 6th and (23.4-27.3) x 10 to the 6th. An analysis of experimental results shows that asymmetric cooling of the wing surface leads to an asymmetric development of the laminar-to-turbulent transition. B.J.

A82-18596 † **A study of the effect of the flight vehicle body potential on the characteristics of ion attitude transmitters (Issledovanie vliianiia potentsiala korpusa letatel'nogo apparata na kharakteristiki ionnykh datchikov orientatsii).** G. V. Eniutin, V. V. Skvortsov, and A. A. Uspenskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 166-172. In Russian.

The effect of the flight vehicle body potential on the angular characteristics of ion attitude transmitters has been modeled experimentally in an ionized gas flow with parameters similar to those of the ionosphere. Possible ways to suppress this effect are examined, including the use of metal disks and screen grids in front of the transmitters. V.L.

A82-18612 † **Application of the finite element method to the calculation of the modes and frequencies of natural vibrations of aircraft structures (Primenenie metoda konechnykh elementov k raschetu form i chastot sobstvennykh kolebanii aviatsionnykh konstruktsii).** T. V. Snisarenko. *TsAGI, Uchenye Zapiski,* vol. 12, no. 1, 1981, p. 137-140. 6 refs. In Russian.

The paper develops a method for calculating the modes and frequencies of natural vibrations based on the finite-element modeling of the elastic and mass properties of the structure. An algorithm for solving the incomplete eigenvalue problem for a system of high-order equations is examined. The natural vibrations of a cylindrical shell are calculated as an example. B.J.

A82-18620 † **Torsional vibrations of a wing carrying a concentrated load /asymptotic behavior/ (Krutil'nye kolebaniia kryla, nesushchego sosredotochennyi gruz /asimptotika/).** Ia. M. Parkhomovskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 3, 1981, p. 69-82. In Russian.

Asymptotic formulas are obtained for the frequencies and modes of torsional vibrations of a wing carrying a concentrated load. These formulas are used to study the characteristics of the higher tones of the torsional vibrations. Results are presented for loads elastically and rigidly attached to the wing. B.J.

A82-18621 † **Calculation of the stability of crosswise-reinforced cylindrical shells (K raschetu ustoichivosti karkasirovannykh tsilindvicheskikh obolochek).** G. N. Zamula and K. M. Ierusalimskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 3, 1981, p. 83-94. 9 refs. In Russian.

General equations of stability and thermal stability are obtained for crosswise-reinforced noncircular cylindrical shells. The analysis takes into account nonuniform loading, variable stiffness, the anisotropy of the structure, and nonlinear effects. The equations make it possible to analyze the shell stability with allowance for the plastic state of the material and the buckling of the skin. The development of computational algorithms for this stability analysis is considered. B.J.

A82-18691 # **Fluidics in aircraft engine controls.** G. E. Davies (Plessey Aerospace, Ltd., Fareham, Hants., England). *ASME, Transactions, Journal of Dynamic Systems, Measurement, and Control,* vol. 103, Dec. 1981, p. 324-330. 6 refs.

Fluidics may be used to measure pressure ratio as a fundamental engine performance parameter using simple robust components, capable of withstanding high pressures and temperatures, and severe vibration. It improves the accuracy of measurement, and obviates the need of conventional systems to utilize nonoptimum, but easier to control parameters. A wide range of aircraft engine controls has been developed, including those for compressor inlet guide vanes, compressor bleed valves, engine fuel flow, and instrumentation. Total fluidic unit deliveries are now over 4200, and the civil operating hours exceed 13.5 million. A completely fluidic engine control is proposed with an electronic computer-controlled trim system for efficiency optimization. J.F.

A82-18726 **Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, North Carolina State University, Raleigh, NC, June 8-10, 1981.** Conference sponsored by the North Carolina State University and the Institute of Noise Control Engineering. Edited by L. H. Royster, F. D. Hart (North Carolina State University, Raleigh, NC), and N. D. Stewart (Acoustical Consultants, Inc., Gary, NC). Poughkeepsie, NY, Noise Control Foundation, 1981. 482 p. $42.

Topics discussed include noise control regulations and benefits, noise source identification, and the applications of damping materials. Papers are presented on Federal control technology initiatives in occupational noise, sound power measurement using the cross-spectral technique, low frequency noise reduction of acoustic enclosures, and the reflection and absorption of high-intensity sound at the surface of bulk porous materials. Attention is also given to nonacoustic design parameters for industrial mufflers, to educational programs for hearing conservation, and to a finite element analysis applied to open-end spinning noise. C.R.

A82-18727 **Reduction of the acoustic environment in an F100-PW-100 engine test cell.** V. R. Miller (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 257-260. 5 refs.

It is found that adding the acoustic treatment to the modification of the ejector tube lowers the acoustic environment in the test cell. The measured acoustic levels after modifications are below the design levels for engine structures as close as 40 inches ahead of the engine exhaust plane for maximum afterburner for the aft ejector tube position (AETP) and standard ejector tube position (SETP) configurations. The acoustic environment in the modified test cell is found to be lowest when the ejector tube is in the aft position (AETP). The measured acoustic levels exceed the design levels for engine structure with engine operation at the forward ejector tube position (FETP) configuration at maximum afterburner. C.R.

A82-18728 **Development of a transmission loss test facility for light aircraft structures.** C. K. Barton (Garrett Turbine Engine Co., Phoenix, AZ). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 265-268.

The development of a transmission loss (TL) test facility designed specifically for light aircraft structures is described, and preliminary data obtained in the new facility are presented. The facility features automated control of the entire measurement procedure through the use of a desk-top computer interfaced with digital relays and a one-third octave frequency analyzer. The computer is programmed to start and stop the sound sources, switch microphones for the analyzer, and operate the analyzer. C.R.

A82-18729 * **Acceleration response of fuselage sidewall panels on a twin-engine, light aircraft.** L. A. Roussos and J. S. Mixson (NASA, Langley Research Center, Hampton, VA). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 291-294.

A response analysis is carried out to determine the predictability of sidewall accelerations in aircraft, to investigate whether it is necessary to model the exterior pressure as a traveling wave as opposed to a standing wave, and to determine the importance of parameters describing the exterior pressure and sidewall panel. Prediction of the acceleration response is found to be improved by including traveling wave and spatial variation effects of the exterior pressure in the model. Variations with propeller rpm are found to be important for the longer panel. C.R.

A82-18730 **Noise control plan for a new airplane manufacturing facility.** M. D. Lockleer and R. C. Klein (Boeing Commercial Airplane Co., Seattle, WA). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 299-302.

The work done by a noise technology staff in designing a noise control treatment for a new factory that had already been designed and had an established floor plan is described. The staff also had the responsibility of estimating noise levels in the new factory before it was completed. The noise-estimating procedures were based on acquiring noise measurements in a similar manufacturing facility with comparable enclosed area dimensions, production activities, and room characteristics. Noise was measured along the periphery of each area by recording the dBA level for a period of one minute. These noise levels were then transferred onto the new factory floor layout, where they were adjusted to account for work cycle, density of work parts, and number of production workers per unit area. C.R.

A82-18731 **Noise monitoring in airport communities.** W. K. Connor (Tracor, Inc., Austin, TX). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 401-406. 6 refs.

Current noise monitoring practices at airports are surveyed, with emphasis placed on extent, implementation, and rationale. It is noted that contemporary aircraft monitoring systems can perform a wide variety of functions in support of an airport noise abatement program. In establishing a system, the importance of developing the program before locating the stations and specifying functions is stressed. Among the basic design considerations are the location and type of the central station, the number and locations of the remote stations, the type of data output, the amount of data to be stored, and the operating costs. C.R.

A82-18732 * **Quantification of airport community noise impact in terms of noise levels, population density, and human subjective response.** R. DeLoach (NASA, Langley Research Center, Hampton, VA). In: Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, Raleigh, NC, June 8-10, 1981. Poughkeepsie, NY, Noise Control Foundation, 1981, p. 419-422. 7 refs.

The Fraction Impact Method (FIM), developed by the National Research Council (NRC) for assessing the amount and physiological effect of noise, is described. Here, the number of people exposed to a given level of noise is multiplied by a weighting factor that depends on noise level. It is pointed out that the Aircraft-noise Levels and Annoyance MOdel (ALAMO), recently developed at NASA Langley Research Center, can perform the NRC fractional impact calculations for given modes of operation at any U.S. airport. The sensitivity of these calculations to errors in estimates of population, noise level, and human subjective response is discussed. It is found that a change in source noise causes a substantially smaller change in contour area than would be predicted simply on the basis of inverse square law considerations. Another finding is that the impact calculations are generally less sensitive to source noise errors than to systematic errors in population or subjective response. C.R.

A82-18776 **The structure of a separating turbulent boundary layer. I - Mean flow and Reynolds stresses. II - Higher-order turbulence results.** R. L. Simpson, Y.-T. Chew, and B. G. Shivaprasad (Southern Methodist University, Dallas, TX). *Journal of Fluid Mechanics*, vol. 113, Dec. 1981, p. 23-51, 53-73. 60 refs. Navy-supported research. Project SQUID.

The structure of a separating turbulent boundary layer was studied experimentally for an airfoil-type flow. Reynolds stress and mean flow were determined, and results are provided for velocity probability distribution flatness and skewness factors for higher order turbulence. The flow was accelerated and decelerated until separation occurred, and measurements were made by hot-wire and laser anemometry. A small mean backflow in the separation is found to be supplied intermittently by large-scale structures passing through the separated flow. This mechanism is suggested to be dominant only when the thickness of the backflow region is small compared with the turbulent shear-layer thickness. M.S.K.

A82-18837 # **The application of bifurcation theory to the study of loss of control over combat aircraft (Application de la théorie des bifurcations à l'étude des pertes de contrôle sur avion de combat).** P. Guicheteau (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Symposium on Combat Aircraft Maneuverability, Florence, Italy, Oct. 5-8, 1981.) ONERA, TP* no. 1981-100, 1981. 14 p. 8 refs. In French.

Nonlinear models of aircraft in spin and loss of control conditions are constructed using bifurcation theory. The cases of Riemann-Hugoniot catastrophe and Hopf bifurcation are considered, and bifurcation and the mechanics of flight are analyzed. A nonlinear model without hysteresis, with angles of attack ranging from -10 to 90 deg and slip angles from -40 to 40 deg is developed for combat aircraft with high wings and back empennage. Behavior at high angles of attack is discussed in terms of regaining control in movements transverse to the depth of the fixed position and in movements of pure depth. Areas of equilibrium of the flight envelope are defined for escaping from the hazardous situations. M.S.K.

emissions characteristics were experienced with each injector type even though the aerodynamic configuration was common to most combustor models. Performance characteristics obtained with the various fuel injector types could not have been predicted from bench-test injector spray characteristics. The effect of the number of operating fuel injectors on performance and emissions is also presented. Author

N82-15041*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INTERACTIVE-GRAPHIC FLOWPATH PLOTTING FOR TURBINE ENGINES
Robert R. Corban Nov. 1981 51 p refs
(NASA-TM-82756; E-1074) Avail: NTIS HC A04/MF A01 CSCL 21E

An engine cycle program capable of simulating the design and off-design performance of arbitrary turbine engines, and a computer code which, when used in conjunction with the cycle code, can predict the weight of the engines are described. A graphics subroutine was added to the code to enable the engineer to visualize the designed engine with more clarity by producing an overall view of the designed engine for output on a graphics device using IBM-370 graphics subroutines. In addition, with the engine drawn on a graphics screen, the program allows for the interactive user to make changes to the inputs to the code for the engine to be redrawn and reweighed. These improvements allow better use of the code in conjunction with the engine program. T.M.

N82-15042 Ecole Polytechnique Federale de Lausanne (Switzerland). Inst. de Thermique Appliquee.
AEROELASTICITY IN TURBOMACHINES
P. Suter, ed. Zurich Juris-Verlag 1981 487 p refs Proc. of 2nd Intern. Symposium, Lausanne, Switzerland, 8-12 Sep. 1980
(EPFL-ITA-10; ISBN-3-260-04871-5) Avail: Issuing Activity

The understanding and prevention of failures in turbomachines caused by aeroelastic blade vibrations is considered. Calculation of subsonic cascades, cascade tests, vibration measurements and annular cascade tests, unsteady supersonic flow in cascades, and theoretical methods are discussed.

N82-15047 Tokyo Univ. (Japan). Inst. of Space and Aeronautical Sciences.
AERODYNAMIC RESPONSE OF A BLADE IN PITCHING OSCILLATION WITH PARTIAL AND FULL SEPARATION
H. Tanaka, I. Fujimoto, and S. Ishii *In* Ecole Polytechnique de Lausanne Aeroelasticity in Turbomachines 1981 p 129-142 refs
Avail: Issuing Activity

The aerodynamic responses of a blade in pitching oscillation with separation bubble and trailing edge separation are analyzed, and the mechanism of energy transfer between the oscillating blade and the air flow is elucidated. In the state of partial separation and leading edge separation, the aerodynamic response of a Goe801 model airfoil vibrating in pitching motion around a midchord of the blade was observed in a blowdown low speed wind tunnel. The dynamic pressure distribution along the blade surface was measured. By considering physical phenomena on the blade surface, it is understood how the phase shift of the unsteady pressure on the blade surface is affected by the deformation of the pressure wave caused by the movement of the reattaching point of the separation bubble and the separation point of trailing edge separation. Author (ESA)

N82-15048 Ecole Polytechnique Federale de Lausanne (Switzerland).
DAMPING FOR TURBOMACHINE BLADE VARIATIONS IN SUBSONIC FLOW
G. S. Pisarenko, A. A. Kaminer, V. A. Balalayev, N. Y. Nastenko, A. L. Stelmach, and A. V. Dunayev *In its* Aeroelasticity in Turbomachinery 1981 p 151-161 refs

Avail: Issuing Activity

The reduction of dynamic stresses in turbomachine blades through an increase in aerodynamic damping of blade vibration is discussed. The influence of camber and stagger angle are investigated. An aeroelastic damping analysis for the case of stalled flow is presented. An experimental investigation of aerodynamic damping for planar bending and torsional vibrations of a flat cascade of model blades was carried out. In the range of camber variation from 0.025 to 1.0 dependence turns out not to be substantial; increased aerodynamic damping that never exceeds 10 to 15% accompanies an increase in camber. The influence of stagger angle on damping is also revealed to be relatively slight for angle variations from 0 to 60 deg. Author (ESA)

N82-15049 Toshiba Research and Development Center, Kawasaki (Japan). Research and Development Center.
SELF EXCITED FLOW OSCILLATION IN THE LOW PRESSURE STEAM TURBINE CASCADE
T. Araki, Y. Okamoto, and F. Ohtomo *In* Ecole Polytechnique de Lausanne Aeroelasticity in Turbomachines 1981 p 171-186 refs
Avail: Issuing Activity

The problem of unsteady flow in a turbine cascade with subsonic inlet and supersonic outlet flow was approached through experiments. The type of flow considered occurs at the tip of the last stages of low pressure steam turbine rotors. Experiments were made on a linear cascade over a range of outlet Mach numbers up to 1.8. The measurements included unsteady flow visualization by the Schlieren method and time traces of pressure on the blade surface by transducers on nonoscillating and oscillating blades. In addition, unsteady aerodynamic moments were measured. Results show that the transonic flow field at the tip section of the rotor blades of large steam turbines is steady, operating at rated conditions. Operating under partial load, the steady flow breaks down. Aerodynamic damping in pitching motion for unsteady flow conditions is negative, leading to the possibility that self excited vibration exists in the case of a free standing blade. Author (ESA)

N82-15050 Notre Dame Univ., Ind. Dept. of Aerospace and Mechanical Engineering.
STABILITY AND FLUTTER ANALYSIS OF TURBINE BLADES AT LOW SPEED
T. J. Akai and H. Atassi *In* Ecole Polytechnique de Lausanne Aeroelasticity in Turbomachines 1981 p 187-201 refs

(Contract F49620-78-C-0014)
Avail: Issuing Activity

An aeroelastic analysis for highly loaded turbine blades at low speed is carried out for various vibratory modes. These include pure bending and torsion as well as coupled oscillatory modes. The analysis is based on a complete aerodynamic theory which fully accounts for the blade geometry, flow conditions and cascade parameters. A damping coefficient simulating structural damping is also included. The results clearly show that classical flutter can occur for low speed turbine cascades at typical operating conditions. This is directly attributable to high blade loading and thickness. Author (ESA)

N82-15051 Akademiya Nauk SSSR, Novosibirsk. Inst. of Hydrodynamics.
CALCULATION OF QUASI-STATIONARY AERODYNAMIC FORCE ACTING ON A CASCADE OF OSCILLATING AIRFOILS IN SUBSONIC FLOW
V. B. Kurzin and V. P. Ryabchenko *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 203-210 refs
Avail: Issuing Activity

Nonstationary aerodynamic characteristics of the cascade of thin airfoils in a subsonic gas flow are investigated showing that the influence of gas compressibility on their behavior can be characterized by two parameters: Mach number M and the wave number K. For the cascade of arbitrary airfoils, a theoretical statement of this problem for K tends to zero is considered; here nonstationary aerodynamic characteristics of the cascade are described well by their quasi-stationary approximation. A mathematical model of the nonstationary ideal gas flow at subsonic velocities through an arbitrary airfoil cascade in a quasi-stationary state is formulated. In accordance with the model, functions for the velocity potential wholly define the nonstationary gas flow through the cascade in a quasi-stationary approximation at any time moment. The determination problems for these functions are solved, using Chaplygin's approximation. Author (ESA)

N82-15052 Ecole Polytechnique Federale de Lausanne (Switzerland). Inst. de Thermique Appliquee.
NUMERICAL EXPERIMENTS ON UNSTEADY FLOWS

THROUGH VIBRATING CASCADES
Maurizio Pandolfi *In its* Aeroelasticity of Turbomachines 1981 p 211-228 refs
Avail: Issuing Activity

A numerical approach is presented for computing the inviscid compressible two-dimensional unsteady flow in a vibrating cascade. The full Euler equations are considered and no restrictive assumptions are required about geometry of the blading. The analysis is confined to subsonic flows. The modeling of the boundaries and the numerical methodology is described. Particular attention is paid to the explicit treatment of the wake behind the blade during the unsteady flow. Checks on the accuracy of the computations are made. Calculation results on the steady shockless transonic flow in an impulse cascade, where the exact solution is available, show acceptable agreement at least for the space-like discretization. Further evaluation of accuracy is hindered by a lack of benchmark solutions with which to compare. Author (ESA)

N82-15063 Ecole Polytechnique Federale de Lausanne (Switzerland).
COMPUTER AIDED INVESTIGATION OF TURBOMACHINE AERODYNAMICS AND AEROELASTICITY
S. M. Belotserkovskii, A. S. Volmir, V. V. Kuleshov, M. I. Nisht, G. U. Stepanov, and R. M. Ejodorov *In its* Aeroelasticity of Turbomachines 1981 p 229-249 refs

Avail: Issuing Activity

Computer aided solutions of aeroelasticity problems related to turbomachines are presented. A synthesis of numerical methods from nonstationary aerodynamics and elasticity theory are employed. Solutions derive from an understanding of general characteristics and aerodynamic loads acting on each turbomachine blade while taking into account the interference of the blades and blade rows. Aerodynamic stationary characteristics, aerodynamic derivatives at various values of the vibration frequencies, and aerodynamic characteristics with arbitrary dependence of the kinematic parameters on time were investigated. Elastic deformation of blade and blade/disk systems is explained. A flow chart for the computerized evaluation of these phenomena is shown, the results of which support a turbomachine aeroelasticity mathematical model. Author (ESA)

N82-15064 Mitsubishi Heavy-Industries Ltd., Nagasaki (Japan). Nagasaki Technical Inst.
ON THE NUMERICAL ANALYSIS OF STALL FLUTTER IN TURBINE CASCADES
S. Takahara, T. Adachi, and Y. Kadoya *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 251-262 refs
Avail: Issuing Activity

A numerical method using a triangular finite element mesh pattern is applied in order to solve the problem of unsteady stalled flow through a turbine cascade. The flow in the blade-to-blade plane is assumed to be viscous, and in addition, the friction drag on the blade surface is considered. The basic equations for two-dimensional compressible viscous flow are described. Boundary conditions and a vibration condition are also explained. Numerical results for low pressure end blades of a steam turbine are compared with flutter test data on aerodynamic damping and satisfactory agreement is obtained between calculation and experiment. Author (ESA)

N82-15065 Imperial Coll. of Science and Technology, London (England).
A METHOD FOR FORCE DETERMINATION FROM VIBRATION RESPONSE MEASUREMENTS
D. J. Ewins and B. Hillary *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 263-283 refs
Sponsored by Rolls Royce Ltd.

Avail: Issuing Activity

Dynamic force determination from response measurements was studied numerically and experimentally. Application to turbomachine blades undergoing steady or transient vibration is considered. In theory, the case of harmonic excitation and response is expressed as an inverse input/output equation. A cantilever beam and an isolated turbomachine blade were used as test pieces for the experimental study. Results show that application of the pseudoinverse force determination method is subject to a form of conditioning in the region of the fundamental mode. However, the results of tests on an actual compressor blade suggest that with very accurate dynamic modeling of the test structure and careful curve fitting this method is feasible, using current techniques and equipment. Author (ESA)

N82-15066 Brown, Boveri and Co., Ltd., Baden (Switzerland).
CONTROL OF VIBRATION IN AEROELASTIC CASCADE EXPERIMENTS
A. Krischner, B. Fosco, and E. Muller *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 285-296 refs
Avail: Issuing Activity

The aeroelastic behavior of an annular, transonic turbine cascade with three degrees of freedom and an electromagnetic excitation system was investigated. Excitation and vibration control which allows measurement of effective damping in the stable operating domain of the cascade is discussed. The vibration control system demonstrates its capability to maintain preset vibration amplitudes and interblade phase angles throughout the resonance range if sufficient damping is present. Author (ESA)

N82-15067 New South Wales Univ., Kensington (Australia). School of Mechanical and Industrial Engineering.
STABILITY ANALYSIS OF THE TWIN MODE MODEL OF COUPLED FLEXION/TORSION VIBRATIONS IN TURBOFANS
R. A. J. Ford *In* Ecole Polytechnique De Lausanne Aeroelasticity of Turbomachines 1981 p 297-308 refs

Avail: Issuing Activity

The twin mode representation of coupled flexion/torsion vibrations in turbofans, a linear feedback system which depicts flutter as a system instability, is reviewed. An analysis which uses classical automatic control theory is presented. A stability analysis for zero phase lag on aerodynamic coupling is developed. A transfer function for the system is found, and determination of stability using Routh's criterion is explained. A more versatile characterization of flutter behavior for the twin orthogonal mode model results. Author (ESA)

N82-15068 Rolls-Royce Ltd., Derby (England). Aero Div.
AERODYNAMIC CONSIDERATIONS IN THE PREDICTION OF UNSTALLED SUPERSONIC FLUTTER IN TRANSONIC FANS
D. G. Halliwell *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 309-322 refs

Avail: Issuing Activity

Two methods for the prediction of unsteady lift and moment coefficients for blades with supersonic entry flow pertaining to coupled flutter in turbofans are discussed. The first method uses a linearized supersonic model, with only weak pressure waves, while the second uses a strong normal shock model, however both are based on flat plate cascades. A basic problem in the application of the first model is discussed and a correction procedure to obtain a more rational solution is suggested. For the second model, although its shock structure is closer to the real case, overall comparison with experiment shows no improvement on the simpler model. However, results are qualitatively consistent with implied working line differences. Author (ESA)

N82-15069 Kyushu Univ., Fukuoka (Japan). Dept. of Aeronautical Engineering.
EFFECT OF MEAN BLADE LOADING ON SUPERSONIC CASCADE FLUTTER
M. Namba and R. Minami *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 323-332 refs

Avail: Issuing Activity

A theory for supersonic cascade flutter with nonzero mean blade loadings was developed. An inviscid supersonic flow past a rectilinear two-dimensional cascade with subsonic leading edge locus was investigated. The theory allows for the effect of displacement of mass source and body force singular points which represent blades with nonzero thickness and mean lift force, but it neglects the effect of deviation of the local convection velocity and local speed of sound from the undisturbed uniform ones. The theory also predicts the occurrence of supersonic bending flutter at higher blade loadings. Author (ESA)

Low-speed aerodynamic performance of a high-aspect-ratio supercritical-wing transport model equipped with full-span slat and part-span double-slotted flaps [NASA-TP-1580] N82-15015

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An experimental investigation of the influence of vertical wind shear on the aerodynamic characteristics of an airfoil
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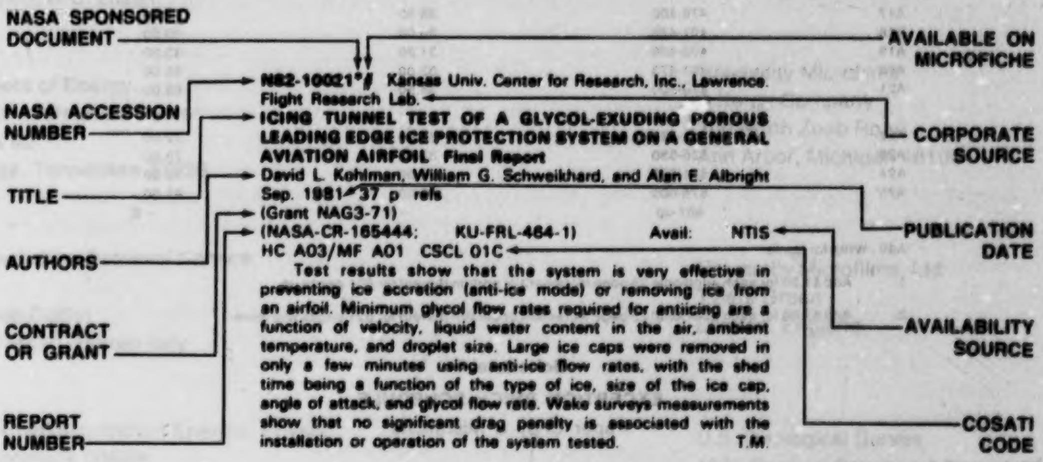
TYPICAL CITATION AND ABSTRACT FROM *STAR*



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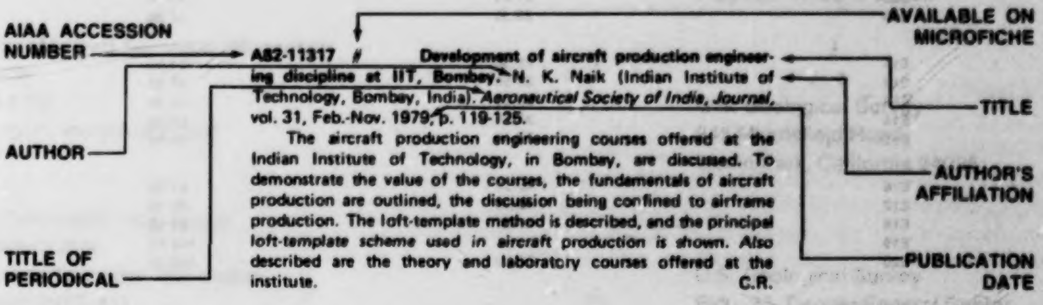
N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

TYPICAL CITATION AND ABSTRACT FROM *IAA*



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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 147)

APRIL 1982

IAA ENTRIES

A82-16025 **A high strength ejector release unit for the Tornado.** L. Botting (Normalair-Garrett, Ltd., Yeovil, Somerset, England). *Aircraft Engineering,* vol. 53, Nov. 1981, p. 10-15.

The development of bomb ejector release units (ERU) is traced, and an ERU suitable for the MACE form of suspension is described. The design of the ERU is provided, noting its use on the Tornado and its acceptability for NATO armaments. Reduced drag has been experienced by use of the ERU, and sway-bracing is achieved without crutch arms, although these can added with a conversion kit. A 3.3 m/sec ejection velocity has been measured for a store mass of 544 kg within a reaction limitation of 44.5 kn. The unit withstands 30 firings before maintenance, and recommendations for system alterations for use with smart weapons are outlined. M.S.K.

A82-16040 # **On unsteady aerodynamic forces and moments of the circular cascading blades /Experiments of the outward-flow case/.** K. Nishioka and H. Kuroda (National Defense Academy, Yokosuka, Kanagawa, Japan). *JSME, Bulletin,* vol. 24, Oct. 1981, p. 1739-1747. 15 refs.

The unsteady forces and moments acting on the blades of centrifugal machines which vibrate harmonically in a torsional mode about the mid-chord have been studied experimentally. At small interblade phase angles, the unsteady normal forces and moments are found to vary periodically as a function of the cascade geometry, flow coefficient, and the wake length of vortex distribution; for small flow coefficients, the damping moments become negative. When the interblade phase angle is more than 180 deg, the aerodynamic damping moment becomes negative for relatively small reduced frequencies. As the interblade phase angle increases still further, the damping moment becomes negative even at comparatively large reduced frequencies. Experimental results are in qualitative agreement with theory. V.L.

A82-16091 # **Workshop report for the AIAA 6th Aeroacoustics Conference.** C. K. W. Tam (Florida State University, Tallahassee, FL). *Journal of Aircraft,* vol. 18, Dec. 1981, p. 1005-1010. 5 refs.

Summaries are given of the workshops conducted at the AIAA 6th Aeroacoustics Conference, each summary having been prepared by the workshop chairmen. The six workshops are: jet noise, duct acoustics, turbomachinery noise, aircraft interior noise, airframe and propulsive lift noise, and propeller and helicopter noise. It is noted that the primary purpose of the workshops is to provide a forum where new ideas and concepts can be openly discussed and controversies freely debated. C.R.

A82-16092 # **Infrared emissions from turbofans with high aspect ratio nozzles.** R. Decher (Washington, University, Seattle, WA). *Journal of Aircraft,* vol. 18, Dec. 1981, p. 1025-1031. 12 refs.

A mixed flow turbofan is analyzed from the point of view of IR emission characteristics. A simple absorption coefficient model of the core flow gas displays the potential effectiveness of high aspect ratio nozzles as a variable in the design of aircraft engine installations for low IR signature. The simplicity of the model described and the limited view perspectives used to assess the signature restrict the usefulness of the results to that of guiding preliminary design. In general, more precise solutions are complex and depend on specification of a relatively large number of independent variables to describe the source - seeker geometry, weather, etc. The level of effort to carry out more accurate analysis may be inconsistent with the preliminary design process where simple criteria such as those described may be sufficient to select the best of several candidate designs. The influence of cycle parameters is assessed using an n-th power dependence of radiation on temperature and a simple mixing model to estimate the core length. The analysis shows that cycle parameters which improve cycle efficiency and thus fuel consumption also reduce IR emissions. Bypass ratio near unity gives low IR signature for both optically thin and thick spectral regions. (Author)

A82-16098 # **Symmetric flow characteristics of thin rectangular wings.** E. S. Larson (Flygtekniska Forsoksanstalten, Stockholm, Sweden). *Journal of Aircraft,* vol. 18, Dec. 1981, p. 1070, 1071. 7 refs. Research supported by the Defense Materiel Administration.

Semiempirical analytic expressions are presented which are shown to contain in themselves Mach number influences that are in very good agreement with the investigated panel method results for M less than or equal to 1, the intended regime of application of the equations. The differences between the equations and the theoretical results are small and in fact only of minor significance when shortcut evaluations are desired. It is noted, however, that a comparison with relevant transonic experimental results, if such results existed, would show an appreciable discrepancy in the transonic regime as a result of the neglect of genuine transonic terms in the linearized theory. C.R.

A82-16135 # **Aerospace highlights 1981.** *Astronautics and Aeronautics,* vol. 19, Dec. 1981, p. 24-34, 36-40, 42-108.

Topics such as air transportation systems, aeroacoustics, aerospace power systems, aircraft design, interactive computer graphics, and flight simulation are considered. Attention is also given to flight mechanics, extendible exit cones, general aviation systems, LTA vehicles, and testing programs. Plasma dynamics and lasers are discussed, as are solid rockets, propellants, software systems, sensors, marine technologies, and CAD/CAM. Finally, papers are presented on terrestrial energy systems, structural dynamics, space sciences, space structures, thermophysics, V/STOL aircraft, aerospace maintenance, communications, economics, and electric propulsion, as well as materials, management, and guidance and control. M.S.K.

A82-16143 **Aircraft composite materials and structures.** A. J. Dastin (Grumman Aerospace Corp., Advanced Development Section, Bethpage, NY). *SAMPE Journal,* vol. 17, Nov.-Dec. 1981, p. 10-15.

A ten year advanced composite aircraft structural history is reviewed. Composite material development is traced from fiberglass epoxy to mixed fiber polymer hybrids containing boron, graphite and Kevlar. Typical composites processing and tooling approaches utilized in the industry is given along with techniques being developed for high volume production. (Author)

A82-16148 **The well tempered transport aircraft engine /The Sir Henry Royce Memorial Lecture/.** J. G. Borger. *Aeronautical Journal,* vol. 85, Nov. 1981, p. 398-412.

An historical account is presented of the development, over 40

Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0161. 9 p. 9 refs. Contract No. F44620-81-C-0044.

The transonic canard-wing interaction problem is simulated using modified small disturbance (MSD) transonic theory. The wing and the canard are treated in a sheared fine grid system that is embedded in a global Cartesian crude grid. An appropriate far field and asymptotic expression for the velocity potential derived using Green's theorem is implemented. Results are presented for a few canard-wing configurations and compared with available experimental data. The weakening of the wing shock due to the presence of the canard downwash is illustrated in terms of contour plots. An empirical incidence correction for the wing leading edge vortex gives good agreement with experiment at low incidences. For higher angles of attack, the results indicate that a more sophisticated vortex roll-up and induction model is required. (Author)

A82-17815 # **A more-accurate transonic computational method for wing-body configurations.** L. T. Chen (McDonnell Douglas Research Laboratories, St. Louis, MO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0162.* 10 p. 16 refs. Contract No. N000167-81-C-0057.

Second- and third-order, quasi-conservative and fully conservative schemes have been developed for computing inviscid flowfields about transonic wings. The fully conservative schemes are developed by modifying an existing finite-volume algorithm, while the quasi-conservative schemes are developed by solving a transformed full-potential equation with the addition of new second- or third-order artificial viscosities at supersonic points. A new shock-point operator is introduced, which adjusts the amount of nonconservative differencing at shock points and thus modifies the location and strength of captured shocks. Numerical results obtained using the second- and third-order schemes will be discussed and compared with experimental data. (Author)

A82-17816 * # **Transonic three-dimension viscous-inviscid interaction for wing-body configuration analysis.** E. G. Waggoner (Vought Corp., Dallas, TX). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0163.* 12 p. 16 refs. Contract No. NAS1-16055.

A three-dimensional small disturbance transonic analysis code has been coupled with a three-dimensional integral boundary layer code. A scheme was developed to interact the two codes through the use of a controlling module. The resulting hybrid code does not increase the costs or computer core requirements over that of the previous capabilities of the analysis code, which used a two-dimensional boundary layer analysis to model viscous effects. Several configurations have been analyzed and results compared against both experimental data and computational results using the two-dimensional viscous model. Results indicate good agreement with experimental data when using the three-dimensional interaction scheme, with the most marked improvement in the correlations observed for wing pressure coefficient predictions in the lower surface cusp region for supercritical wings. (Author)

A82-17820 # **Recent improvements in prediction techniques for supersonic weapon separation.** A. Cenko (Grumman Aerospace Corp., Bethpage, NY) and J. Waskiewicz (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0170.* 9 p. 7 refs. Contract No. F33615-81-3011.

The Influence Function Method (IFM) considered in the investigation has been reported by Meyer et al. (1981). The principal assumption is that a store's normal force and moment in a nonuniform flow can be correlated with the angle-of-attack distribution along the store length. At supersonic speeds, the influence coefficients A and B can be determined by traversing a store through an oblique shock generated by a wedge and measuring the normal force and moment along the traverse. Theoretically determined weapon/store influence coefficients for four stores are shown to yield accurate IFM store force and moment predictions. Considering the geometric dissimilarity of the stores examined in the study, it would appear that the use of theoretically determined influence coefficients is a practical and cost-effective alternative to the use of experimental weapon calibrations for IFM applications at supersonic speeds. G.R.

A82-17827 # **Determination of Learjet Longhorn airplane horizontal tail load and hinge moment characteristics from flight data.** G. D. Park and M. H. Abla (Gates Learjet Corp., Wichita, KS). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0183.* 8 p. 21 refs.

Gates Learjet Corporation recently received the type certificate for the Model 55 Longhorn, its newest and largest business jet aircraft. During the certification effort, the aircraft flight characteristics, as well as the horizontal tail airloads and elevator hinge moments, were evaluated from inflight response data. The purpose of these analyses were to verify the design airloads used in the documentation required for FAA certification. Two parameter identification computer programs developed by NASA were used. One was developed by Taylor and Iliff in 1972. The other was developed by Maine and Iliff in 1980. (Author)

A82-17828 # **A binary matrix technique for aircraft collision threat recognition and avoidance.** M. N. Wagdi (Riyadh, University, Riyadh, Saudi Arabia). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0184.* 9 p.

A new technique is presented for aircraft collision threat recognition and avoidance. The lateral plane of the airspace in front of own aircraft is represented by a square binary matrix, whose central element coincides with the own aircraft body axes system. Each element of the binary matrix defines an airspace cell with known area. The elements representing the flight domains of own and threat aircraft have digits 1 while all other elements are zeros. The binary matrix approach enables one to project the three dimensional threat information onto a two dimensional indicator. This is done through the introduction of the threat signal intensity concept. A possible collision threat is recognized when the digit in one of the cells bounding the own aircraft domain changes from 0 to 1. The location of such cell in the binary matrix indicates the threat bearing angles. An evasive maneuver based on such information is thus initiated. (Author)

A82-17831 # **3 DOF gyro analysis from measured and derived rates.** G. T. Chrusciel and N. J. French (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0189.* 13 p. 5 refs.

Hypersonic three degree-of-freedom (3DOF) angular motion reentry simulation tests were performed using telemetry of onboard rate gyro signals for direct extraction of the aerodynamic moments. Conditions are described which produced high quality signals during one test entry and intermittant loss of signal for a subsequent test. Body fixed angular rate data were reconstructed from the 3DOF balance angular position results; these compared well with the gyro data. Feasibility of using the AEDC 3DOF gas bearing angular data for extraction of moments is demonstrated by good agreement of aerodynamic moments extracted using the derived rates and gyro rates. (Author)

A82-17833 * # **Development and operating characteristics of an advanced two-stage combustor.** W. Greene, S. Tanrikut (United Technologies Corp., Commercial Products Div., East Hartford, CT), and D. E. Sokolowski (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0191.* 14 p. 10 refs.

Results are presented from an experimental program aimed at optimizing the features of an advanced two-stage combustor that currently is being developed as part of the National Aeronautics and Space Administration/Pratt & Whitney Aircraft Energy Efficient Engine program. The combustor is designed to meet stringent goals for performance, emissions, durability and operational characteristics. An overview of the design selection process in light of these goals is discussed. Combustor rig test results, which highlight the techniques used to reduce emissions, development of the pilot and main power zone fuel injection systems, and methods of achieving efficient fuel staging, are presented. (Author)

A82-17838 * # **Water ingestion into jet engine axial compressors.** T. Tsuchiya and S. N. B. Murthy (Purdue University, West Lafayette, IN). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0196*. 11 p. 14 refs. Contract No. F33615-79-C-2401; Grant No. NAG3-02.

An axial flow compressor has been tested with water droplet ingestion under a variety of conditions. The results illustrate the manner in which the compressor pressure ratio, efficiency and surging characteristics are affected. A model for estimating the performance of a compressor during water ingestion has been developed and the predictions obtained compare favorably with the test results. It is then shown that with respect to five droplet-associated nonlinearly-interacting processes (namely, droplet-blade interactions, blade performance changes, centrifugal action, heat and mass transfer processes and droplet break-up), the initial water content and centrifugal action play the most dominant roles. (Author)

A82-17843 # **An experimental investigation of the influence of vertical wind shear on the aerodynamic characteristics of an airfoil.** F. M. Payne (Boeing Commercial Aircraft Co., Seattle, WA) and R. C. Nelson (Notre Dame, University, Notre Dame, IN). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0214*. 10 p. 17 refs. Research supported by the University of Notre Dame; U.S. Department of Transportation Contract No. RC-82010.

An experimental wind tunnel investigation was carried out to determine the influence of a vertical wind shear on the static longitudinal aerodynamic coefficients (i.e., the sectional drag, lift, and moment coefficients) of an airfoil. Force balance and surface pressure measurements were obtained from a NACA 0018 airfoil in a linear velocity gradient. The airfoil was tested in a Reynolds number range from 75,000 to 200,000, with endplates to simulate an infinite wing, and with the outboard endplate removed to simulate a finite wing. The effect of grit on the surface of the airfoil was also investigated. The influence of the velocity gradient on the aerodynamic characteristics of the airfoil was found to be small, especially in comparison to the effects of the grit. (Author)

A82-17844 * # **Simulation of phugoid excitation due to hazardous wind shear.** W. Frost (FWG Associates, Inc.; Tennessee, University, Space Institute, Tullahoma, TN), B. S. Turkel (Peachtree Dekalb Airport, Atlanta, GA), and J. McCarthy (National Center for Atmospheric Research, Boulder, CO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0215*. 13 p. 11 refs. Contract No. NAS8-33458.

Computer and manned flight simulator studies of the effect of thunderstorm wind shear on the excitation of phugoid oscillations of commercial-type aircraft are reported. Previous studies have suggested that the characteristic scale of thunderstorm wind shear drives commercial-type aircraft at the critical phugoid frequency. To further investigate this phenomenon, aircraft performance in a hypothetical sinusoidal wind shear was investigated. Sinusoidal winds at the phugoid frequency and with frequencies above and below this value were studied both analytically and in manned flight simulators. Results indicate that excessive oscillations in flight path amplitude predicted by computer analyses were not fully collaborated by the manned flight simulator studies. Some resolution of this problem is given and additional research necessary to further identify the discrepancies between the flight simulator and the computer analysis is outlined. (Author)

A82-17855 * # **Three-dimensional flow studies on a slotted transonic wind tunnel wall.** J. M. Wu, F. G. Collins, and M. K. Bhat (Tennessee, University, Space Institute, Tullahoma, TN). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0230*. 12 p. 18 refs. Grant No. NsG-2379.

Three-dimensional flow field measurements were made near a transonic slotted wall. Field velocity vectors and static pressure distributions have been obtained. The boundary layer displacement thickness was found to vary in the transverse plane with its maximum at the slot center line but decreased with increasing suction rate through the slot. The boundary layer characteristics were sensitive to the mass transfer through the slot. The projection on the flow field velocity vectors on the transverse plane reveals a vortex-like flow formation. The center of this secondary flow was located nearly at the edge of the wall shear layer and decreased in strength with applied suction. The secondary vortex motion may be attributed to the mean flow skewing, inhomogeneous transverse plane boundary layer and the wall turbulence anisotropy. (Author)

A82-17856 * # **Vortex lift augmentation by suction on a 60 deg swept Gothic wing.** A. H. Taylor, L. R. Jackson, and J. K. Huffman (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0231*. 8 p. 12 refs.

An experimental investigation was conducted in the Langley high-speed 7- by 10-foot wind tunnel to determine the aerodynamic performance of suction applied near the wing tips above the trailing edge of a 60 deg swept Gothic wing. Movable suction inlets were symmetrically mounted in the proximity of the trailing edge, and the amount of suction was varied to maximize wing lift. Tests were conducted at Mach 0.15, 0.30, and 0.48, and the angle of attack was varied from -4 to 50 deg. The suction augmentation increases the lift coefficient over the entire range of angle of attack. The lift improvement exceeds the unaugmented wing lift by over 20%. Moreover, the augmented lift exceeds the lift predicted by vortex lattice theory to 30 deg angle of attack. Suction augmentation is postulated to strengthen the vortex system by increasing its velocity and making it more concentrated. This causes the vortex breakdown to be delayed to a higher angle of attack. (Author)

A82-17858 * # **Recent sidewall boundary-layer investigations with suction in the Langley 0.3-m Transonic Cryogenic Tunnel.** A. V. Murthy, C. B. Johnson, E. J. Ray, and P. L. Lawing (NASA, Langley Research Center, Transonic Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0234*. 12 p. 21 refs.

An experimental and theoretical study of the Langley 0.3-m Transonic Cryogenic Tunnel (TCT) sidewall boundary-layer with and without suction, has been made. Without suction, the boundary-layer displacement thickness at a station ahead of the model varied from about 1.6 mm to 1.3 mm over a Reynolds number range of 20 million to 200 million per m at Mach numbers from 0.30 to 0.78. Measured velocity profiles were correlated using the defect law of Hama. The boundary-layer displacement thickness decreased when suction was applied; however, after suction of about 2 percent of test section mass flow, the change in the thickness was small. A comparison of the measured suction effectiveness with finite difference and integral methods of boundary-layer calculation showed that both methods predicted the right trend over the range of suction velocities (up to a suction to free-stream velocity ratio of -0.02). (Author)

A82-17861 * # **Dynamic stability of a buoyant quad-rotor aircraft.** B. L. Nagabhushan and N. P. Tomlinson (Goodyear Aerospace Corp., Defense Systems Div., Akron, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0242*. 10 p. 13 refs. Contract No. NAS2-10777.

Stability characteristics of a buoyant quad-rotor aircraft (BQRA) in hover and forward flight are examined by considering linear, state-variable, and nonlinear flight simulation models of such a configuration. The effects of carrying a sling load on the vehicle dynamics is predicted by considering a coupled model of the two bodies. Inherent stability characteristics of the vehicle are analyzed and compared with those of a helicopter and an airship in free flight. Typical operational conditions that could lead to vehicle instability are described in the flight envelope of interest. (Author)

A82-17862 * # **Bifurcation analysis of nonlinear stability of aircraft at high angles of attack.** W. H. Hui (Waterloo, University, Waterloo, Ontario, Canada) and M. Tobak (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0244*. 11 p. 13 refs. Grant No. [illegible].

The problem of stability of steady flight of an aircraft flying at

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STAR ENTRIES

N82-14048*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
OPTIMIZATION AND PERFORMANCE CALCULATION OF DUAL-ROTATION PROPELLERS
Robert E. Davidson Dec. 1981 48 p refs
(NASA-TP-1948; L-14676) Avail: NTIS HC A03/MF A01 CSCL 01A

An analysis is given which enables the design of dual-rotation propellers. It relies on the use of a new tip loss factor deduced from T. Theodorsen's measurements coupled with the general methodology of C. N. H. Lock. In addition, it includes the effect of drag in optimizing. Some values for the tip loss factor are calculated for one advance ratio. Author

N82-14055*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPARISON OF EXPERIMENTAL AND THEORETICAL TURBULENCE REDUCTION CHARACTERISTICS FOR SCREENS, HONEYCOMB, AND HONEYCOMB-SCREEN COMBINATIONS
James Scheiman Dec. 1981 55 p refs
(NASA-TP-1958; L-14628) Avail: NTIS HC A04/MF A01 CSCL 01A

Turbulence reduction research using screens, honeycomb, and combinations thereof was conducted in a half-scale model of a portion of the Langley 8-foot transonic pressure tunnel. It was found that screens alone reduce axial turbulence more than lateral turbulence; whereas, honeycomb alone reduces lateral turbulence more than axial turbulence. Because of this difference, the physical mechanism for decreasing turbulence for screens and honeycomb must be completely different. It is concluded that honeycomb with a downstream screen is an excellent combination for reducing turbulences. E.A.K.

N82-14056*# National Aeronautics and Space Administration. Washington, D. C.
SYSTEM FOR ACQUISITION AND ANALYSIS OF DYNAMIC TESTS ON AIR INTAKES
P. Perrier, B. Delahaye (SNECMA, Moissy-Cramayel, France), and G. Laruelle (ONERA, Paris) Dec. 1981 54 p refs Transl. into ENGLISH of "Systeme d'Acquisition et d'Analyse pour Essais Dynamiques d'Entees d'Air". Rept. ONERA-TP-1981-37 ONERA, France, 1981 15 p Presented at the AGARD Symp. on Aerodyn. of Power Plant Installation, Toulouse, 11-14 May 1981 Original language document was announced as A81-38240 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by Avions Marcel Dassault-Breguet Aviation
(Contract NASw-3542)
(NASA-TM-76648) Avail: NTIS HC A04/MF A01 CSCL 01A

The problem of compatibility between the airflow developed through the aircraft's air intake ducting and its suitability to the jet engine are studied. A review of the various functions of the air intake is presented. A proposed solution to measure the various parameters is described. The specifications and details of the system permit measurements with a satisfactory reliability on the test bench, as well as in the wind tunnel or in flight. R.J.F.

N82-14057*# National Aeronautics and Space Administration. Washington, D. C.
EXPERIMENTAL INVESTIGATION OF A TRANSONIC POTENTIAL FLOW AROUND A SYMMETRIC AIRFOIL
W. J. Hiller and G. E. A. Meier Dec. 1981 28 p refs Transl. into ENGLISH from Rept. 10/1971 Max-Planck Inst. fuer Stroemungsforschung, Goettingen, W. Germany, Nov. 1971 22 p Original language document was announced as N72-10996 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76678; Rept-10/1971) Avail: NTIS HC A03/MF A01 CSCL 01A

Experimental flow investigations on smooth airfoils were done using numerical solutions for transonic airfoil streaming with shockless supersonic range. The experimental flow reproduced essential sections of the theoretically computed Nieuwland solution. Agreement is better in the expansion part of the of the flow than in the compression part. The flow was nearly stationary in the entire velocity range investigated. Author

N82-14058*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A FLIGHT INVESTIGATION OF BLADE-SECTION AERODYNAMICS FOR A HELICOPTER MAIN ROTOR HAVING 10-64C AIRFOIL SECTIONS
Charles E. K. Morris, Jr. Nov. 1981 181 p refs
(NASA-TM-83226) Avail: NTIS HC A09/MF A01 CSCL 01A

Pressure data at 90 percent blade radius were obtained for a helicopter main rotor with 10-64C blade sections during flight. Concurrent measurements were made of vehicle flight state, performance and some rotor loads. The test envelope included hover, level flight from about 85 to 182 knots, climb and descent, and collective fixed maneuvers. Good agreement is shown between some sets of airfoil pressure distributions obtained in flight and those from two-dimensional wind-tunnel tests or theoretical calculations. A.R.H.

N82-14059*# Low Energy Transport Systems, Capistrano Beach, Calif.
LOW REYNOLDS NUMBER AIRFOIL SURVEY, VOLUME 1 Final Report
B. H. Carmichael Nov. 1981 106 p refs
(NASA Order L-40668)
(NASA-CR-165803-Vol-1) Avail: NTIS HC A06/MF A01 CSCL 10A

The differences in flow behavior two dimensional airfoils in the critical chordlength Reynolds number compared with lower and higher Reynolds number are discussed. The large laminar separation bubble is discussed in view of its important influence on critical Reynolds number airfoil behavior. The shortcomings of application of theoretical boundary layer computations which are successful at higher Reynolds numbers to the critical regime are discussed. The large variation in experimental aerodynamic characteristic measurement due to small changes in ambient turbulence, vibration, and sound level is illustrated. The difficulties in obtaining accurate detailed measurements in free flight and dramatic performance improvements at critical Reynolds number, achieved with various types of boundary layer tripping devices are discussed. E.A.K.

N82-14060# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
ACTA MECHANICA SINICA (SELECTED ARTICLES)
20 Oct. 1981 37 p refs Transl. into ENGLISH from Acta Mech. Sinica (Communist China), no. 3, 1980 p 217-231, 302-310
(AD-A107322; FTD-ID(RS)T-0708-81) Avail: NTIS HC A03/MF A01 CSCL 01/1

Simplified Navier-Stokes equations, their mathematical properties, and equations of flight mechanics used in analyzing the effects of wind and atmospheric turbulence on flight performance are presented. Lifting surface theory for wings in low frequency small amplitude yawing and side slipping oscillating motions at low speeds is also presented.

N82-14061# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
LIFTING SURFACE THEORY FOR WINGS IN LOW FREQUENCY SMALL AMPLITUDE YAWING AND SIDE SLIPPING OSCILLATING MOTIONS AT LOW SPEEDS
Huang Minglie *In its* Acta Mech. Sinica (Selected Articles) (FTD-ID(RS)T-0708-81) 20 Oct. 1981 p 1-16 refs Transl. into ENGLISH from Acta Mech. Sinica (Communist China), no. 3, 1980 p 217-231, 302-310

Avail: NTIS HC A03/MF A01 CSCL 01/1

The mathematical problem of flow at low speeds past a yawing oscillating wing set up by using a coordinate system fixed in the wing is discussed. The oscillating tail vortices behind

N82-15060 Technische Hochschule, Aachen (West Germany). Inst. fuer Strahlantriebe und Turboarbeitsmaschinen.
A METHOD OF CHARACTERISTICS SOLUTION FOR A FINITE OSCILLATING SUPERSONIC CASCADE WITH THICKNESS EFFECTS
K. Vogeler *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 333-347 refs

Avail: Issuing Activity

A method of characteristics approach to a nonlinear oscillating, supersonic cascade is presented. The method is extended to a complete cascade computation for cascades with blades of nonzero thickness on the upper and lower sides. The flow field behind a single oscillating airfoil in a supersonic flow is treated and compared with an analytical flat plate solution. The technique is merged with an existing algorithm. The performance is compared with flat plate and slender blade solutions for infinite cascades. The effect of slender blades in comparison with flat plates on the unsteady aerodynamic response of an oscillating supersonic cascade are calculated for a nonlinear cascade in both the subresonant and superresonant region. Author (ESA)

N82-15061 Akademiya Nauk SSSR, Novosibirsk. Inst. of Hydrodynamics.
CALCULATION OF NONSTATIONARY FORCE RATIOS ON BLADES OF A ROTATING ROW IN INCOMPRESSIBLE FLOW
V. P. Ryabchenko *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 349-356 refs

Avail: Issuing Activity

A numerical solution to a three-dimensional problem of unsteady vortex-free (in the coordinate system coupled with the cascade) flow of ideal incompressible fluid past a rotating annular cascade, based on propeller vortex and finite wing span theory, is presented. The geometry of blade edge is modeled as an annular cascade whose blades are parts of helical surfaces. Aerodynamic force calculations are given only for a large number of blades since it is essential to this method. Analysis results also show the effect of flow three-dimensionality on aerodynamic forces acting on the annular cascade blade when their number is small. Author (ESA)

N82-15062 Tokyo Univ. (Japan). Dept. of Aeronautics.
THREE-DIMENSIONAL ANALYSIS OF CASCADE FLUTTER IN PARALLEL SHEAR FLOW
S. Kaji, H. Takata, and N. Niwa *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 357-370 refs

Avail: Issuing Activity

The effect of spanwise nonuniformity of stream velocity as well as that of oscillation amplitude on flutter characteristics were studied. The main stream is assumed incompressible and to be a parallel shear flow with linear velocity profile. Flutter characteristics vary in spanwise direction in accordance with the variation of flow incidence and flow velocity. The cascade model of a semiactuator disk composed of a number of flat plate blades undergoing bending oscillation is used. It is indicated that the flow shear effect becomes noticeable in connection with oscillation modes. For uniform oscillation it is weak and for linear and quadratic modes it is significant. It is found that weak shear deteriorates aerodynamic damping and extends the unstable frequency range. Author (ESA)

N82-15063 Imperial Coll. of Science and Technology, London (England). Dept. of Aeronautics.
THE EFFECT OF ASPECT RATIO ON THE UNSTEADY AERODYNAMIC FORCES INDUCED BY VIBRATION OF A CASCADE BLADE
J. M. R. Graham and I. Kullar *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 371-381 refs

Avail: Issuing Activity

A correction for three dimensionality made to strip theory when calculating the aerodynamic forces due to vibration of a cascade blade in incompressible flow is discussed. The three dimensional effects arise from the spanwise variation of unsteady velocity induced at the blade by the mode of vibration. Results are presented for simple cantilever type modes of vibration, using a three dimensional unsteady cascade theory for the Fourier transform of the spanwise upwash distribution. An integral equation is formulated which is solved numerically. The integral equation is also used to derive a perturbation solution for the correction terms as a series in inverse powers of the blade aspect ratio. The effect of three dimensionality on the critical reduced frequency for torsional flutter. Author (ESA)

N82-15066 Ecole Polytechnique Federale de Lausanne (Switzerland).
PRACTICAL EXPERIENCE WITH A NONCONTACT BLADE VIBRATION MEASURING SYSTEM IN INDUSTRIAL TURBOCOMPRESSORS
R. Jenny, C. Gremli, and H. B. Guemoes *In its* Aeroelasticity in Turbomachines 1981 p 418-428 refs

Avail: Issuing Activity

Blade vibration measurement with noncontact stationary probes in turbomachines is discussed. Due to the low sampling rate, the problem of nondefinite vibration reconstruction arises. This complicates vibration mode identification which is necessary for stress calculation. A method of probability analysis of the stress amplitude in connection with frequency analysis is presented. Two examples are given and blade flutter and rotating stall identification from turbocompressor measurements are shown. Author (ESA)

N82-15067 Tennessee Univ., Tullahoma. Space Inst.
LINEAR AND NONLINEAR ANALYSIS OF VORTEX WHISTLE: ANOTHER BLADE BUSTER
M. Kurosaka *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 443-453 refs

Avail: Issuing Activity

A flow induced vibration problem in gas turbines, the vortex whistles, is discussed. The whistle is caused by high swirl flow and its characteristics are such that the frequency of fluctuation is discrete (a pure tone). The frequency becomes higher as the swirl or flow rate increases. An incident of vortex whistle is cited. Besides dynamic behavior of the flow field, the data reveal an unexpected change in the steady or time averaged flow field when the whistle is present. It is implicated that dynamic flow can affect even the steady flow field in turbomachinery, which causes damage. Author (ESA)

N82-15068 Mitsubishi Heavy-Industries Ltd., Takasago (Japan). Tagasago Technical Inst.
STUDY OF ACOUSTIC RESONANCE OF CASCADES
M. Honjo and T. Tominaga *In* Ecole Polytechnique de Lausanne Aeroelasticity of Turbomachines 1981 p 455-464 refs

Avail: Issuing Activity

The discrete sound generated by guide vanes was investigated experimentally. A two dimensional cascade test and a three dimensional duct guide vane model test were carried out. It is shown that the discrete noise generated by guide vanes is an acoustic resonance effect in the flow path of the vanes. The main excitation source which induces resonance is wake vortex shedding off the trailing edges of the vanes. Bubble vortices on the concave surfaces or leading edges are not excitation sources. Author (ESA)

N82-15070 Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany).
TECHNICAL EVALUATION REPORT ON THE AEROELASTICITY IN TURBOMACHINES SYMPOSIUM
H. Foershing *In* Ecole Polytechnique de Lausanne Aeroelasticity in Turbomachines 1981 p 469-477 refs

Avail: Issuing Activity

Papers presented at the symposium on aeroelasticity in turbomachines are reviewed. Emphasis is on fluid mechanics of aeroelasticity in turbomachines, motion induced fluid dynamic forces, and unsteady fluid dynamic disturbance forces along with forced blade vibrations. Also covered are classic blade flutter, stalled flow, stall flutter and other unsteady phenomena. Author (ESA)

N82-15073# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
ADVANCED COMPRESSOR COMPONENTS. PHASE 1:

1978 TO 1979 Final Report, May 1980
Wolfgang Walter, Franz Strasser, Eberhard Knodel, and Herbert Merz Bonn Bundesministerium fuer Forschung und Technologie Jul. 1981 250 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-W-81-025; ISSN-0170-1339) Avail: NTIS HC A11/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 42.50

An advanced 800 kW aero engine type compressor was developed. The design is of the axial centrifugal type where the cascades of the axial part have supercritical profiles. Detailed layouts are shown and the aerodynamic design and optimization techniques for the cascades are given. The application of fiber reinforced materials is actively investigated for both the compressor housing and its rotor and a detailed catalog of the various functions of and solicitations for such materials is appended.
Author (ESA)

N82-16074*# Calspan Advanced Technology Center, Buffalo, N.Y.
IN-FLIGHT INVESTIGATION OF THE EFFECTS OF PILOT LOCATION AND CONTROL SYSTEM DESIGN ON AIRPLANE FLYING QUALITIES FOR APPROACH AND LANDING *Final Report*
Norman C. Weingarten and Charles R. Chalk Jan. 1982 215 p refs Sponsored jointly by Dryden Flight Research Facility and USAF Flight Dynamics Labs.
(Contract F33615-79-C-3618)
(NASA-CR-163115; CALSPAN-6645-F-7) Avail: NTIS HC A10/MF A01 CSCL 01C

The handling qualities of large airplanes in the approach and landing flight phase were studied. The primary variables were relative pilot position with respect to center of rotation, command path time delays and phase shifts, augmentation schemes and levels of augmentation. It is indicated that the approach and landing task with large airplanes is a low bandwidth task. Low equivalent short period frequencies and relatively long time delays are tolerated only when the pilot is located at considerable distance forward of the center of rotation. The control problem experienced by the pilots, when seated behind the center of rotation, tended to occur at low altitude when they were using visual cues of rate of sink and altitude. A direct lift controller improved final flight path control of the shuttle like configurations.
E.A.K.

N82-16075*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LONGITUDINAL AND LATERAL STATIC STABILITY AND CONTROL CHARACTERISTICS OF A 1/6-SCALE MODEL OF A REMOTELY PILOTED RESEARCH VEHICLE WITH A SUPERCRITICAL WING
Thomas A. Byrdsong and James B. Hallissy May 1979 118 p refs
(NASA-TP-1360; L-12059) Avail: NTIS HC A06/MF A01 CSCL 01C

An investigation was conducted in the Langley 8-foot transonic pressure tunnel to determine the longitudinal and lateral-directional static stability and control characteristics of a 1/6-scale force model of a remotely piloted research vehicle. The model was equipped with a supercritical wing and employed elevons for pitch and roll control. Test conditions were as follows: Reynolds number of about 6.6 x 10 to the 6th power per meter, variations of sideslip from -6 deg to 6 deg, elevon deflection angle (symmetrically and asymmetrically) from -8 deg to 3 deg, and rudder deflection angle from 0 deg to -10 deg. The model was longitudinally statically stable at angles of attack up to about 7 deg, which is significantly greater than the angle of attack for the cruise condition (approximately 4 deg). In the range of test Mach numbers, the model was directionally stable and had positive effective dihedral, sufficient pitch control, and positive effectiveness of roll and yaw control.
Author

N82-16076*# Lockheed-California Co., Burbank.
ACCELERATED DEVELOPMENT AND FLIGHT EVALUATION OF ACTIVE CONTROLS CONCEPTS FOR SUBSONIC TRANSPORT AIRCRAFT. VOLUME 1: LOAD ALLEVIATION/EXTENDED SPAN DEVELOPMENT AND FLIGHT TESTS *Final Report*
J. F. Johnston Sep. 1979 261 p refs
(Contract NAS1-14690)
(NASA-CR-159097; LR-29000-I-Vol-1) Avail: NTIS HC A12/MF A01 CSCL 01C

Active wing load alleviation to extend the wing span by 5.8 percent, giving a 3 percent reduction in cruise drag is covered. The active wing load alleviation used symmetric motions of the outboard ailerons for maneuver load control (MLC) and elastic mode suppression (EMS), and stabilizer motions for gust load alleviation (GLA). Slow maneuvers verified the MLC, and open and closed-loop flight frequency response tests verified the aircraft dynamic response to symmetric aileron and stabilizer drives as well as the active system performance. Flight tests in turbulence verified the effectiveness of the active controls in reducing gust-induced wing loads. It is concluded that active wing load alleviation/extended span is proven in the L-1011 and is ready for application to airline service; it is a very practical way to obtain the increased efficiency of a higher aspect ratio wing with minimum structural impact.
T.M.

N82-16077*# Lockheed-California Co., Burbank.
ACCELERATED DEVELOPMENT AND FLIGHT EVALUATION OF ACTIVE CONTROLS CONCEPTS FOR SUBSONIC TRANSPORT AIRCRAFT. VOLUME 2: AFT C.G. SIMULATION AND ANALYSIS *Final Report*
D. M. Urie Hampton, Va. NASA Sep. 1979 69 p
(Contract NAS1-14690)
(NASA-CR-159098; LR-29003-Vol-2) Avail: NTIS HC A05/MF A01 CSCL 01C

Relaxed static stability and stability augmentation with active controls were investigated for subsonic transport aircraft. Analytical and simulator evaluations were done using a contemporary wide body transport as a baseline. Criteria for augmentation system performance and unaugmented flying qualities were evaluated. Augmentation control laws were defined based on selected frequency response and time history criteria. Flying qualities evaluations were conducted by pilots using a moving base simulator with a transport cab. Static margin and air turbulence intensity were varied in test with and without augmentation. Suitability of a simple pitch control law was verified at neutral static margin in cruise and landing flight tasks. Neutral stability was found to be marginally acceptable in heavy turbulence in both cruise and landing conditions.
Author

N82-16078# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abt. Flugzeugsteuerung und -regelung.
AN OBSERVER APPROACH TO THE IDENTIFICATION AND ISOLATION OF SENSOR FAILURES IN FLIGHT CONTROL SYSTEMS *Ph.D. Thesis - Tech. Univ., Carolo-Wilhelmina, West Germany*
Norbert Stuckenberg Jul. 1981 140 p refs Report will also be announced as translation (ESA-TT-738)
(DFVLR-FB-81-26; ESA-TT-738) Avail: NTIS HC A07/MF A01; DFVLR, Cologne DM 32

A reliability concept for flight control sensors is presented providing a duplex sensor configuration with fail-operational capabilities by using analytical redundancy with deterministic observers. Without disregarding disturbances and plant parameter variations the identification performance is evaluated with respect to the failure signal properties. The concept is applied to a command and stability augmentation system for the lateral motion of the executive aircraft HFB 320.
Author

N82-16079*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
NASA DRYDEN FLIGHT LOADS RESEARCH FACILITY
Walter J. Sefic Dec. 1981 43 p refs
(NASA-TM-81368) Avail: NTIS HC A03/MF A01 CSCL 14B

The Dryden Flight Loads Research Facility (NASA) and the associated equipment for simulating the loading and heating of aircraft or their components are described. Particular emphasis is placed on various fail-safe devices which are built into the equipment to minimize the possibility of damage to flight vehicles. The equipment described includes the ground vibration and moment of inertia equipment, the data acquisition system, and the instrumentation available in the facility for measuring load, position, strain, temperature, and acceleration.
R.J.F.

N82-16080# Institute for Perception RVO-TNO, Soesterberg (Netherlands).

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Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980
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PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record
A82-18126

Noise-Con 81; Proceedings of the National Conference on Noise Control Engineering, North Carolina State University, Raleigh, NC, June 8-10, 1981
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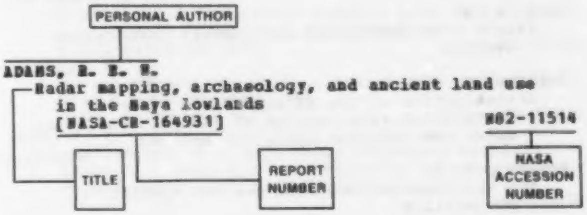

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years, of nine piston and eight turbofan and turbojet engines as installed in 22 different transport aircraft. Attention is given to the contribution of engine design to improvements in overall aircraft performance, as highlighted by such contrasting figures as (1) the 600-800 hour overhaul periods considered acceptable during the Second World War and the 10,000-hour periods typical of present transport aircraft, and (2) the 150 mph speeds and 2400-mile ranges of 84,000-lb aircraft carrying 20 passengers by comparison to 550 mph, 4500-mile range figures for 800,000-lb aircraft carrying 450 passengers. Performance figures are given for engines representative of the state-of-the-art at pivotal points of engine and airframe design development. O.C.

A82-16147 **Digital active control system for load alleviation for the Lockheed L-1011.** G. E. Bendixen (Rockwell International Corp., Cedar Rapids, IA), R. F. O'Connell, and C. D. Siegert (Lockheed-California Co., Burbank, CA). *Aeronautical Journal*, vol. 85, Nov. 1981, p. 430-436. 5 refs.

A digital active control system (ACS) is described which is used to reduce maneuver and gust loads in the extended-wing L-1011 TriStar, permitting improved aircraft performance with minimal wing structure changes. Reliability requirements aimed at high system availability are satisfied by means of a dual-dual, fail operational system architecture in which each of the two ACS computers contains two digital processors. The digital computer provides for control of the aileron servos, self-test capability and redundancy management. Attention is given the compatibility of automatic and primary flight control systems, the digital sensor data transfer functions of the ACS computer and its Algol-like software configuration, redundancy management, and servo and computer monitoring. O.C.

A82-16148 **Scattering of sound by a vortex ring.** T. Kambe and U. M. Oo (Kyushu University, Fukuoka, Japan). *Physical Society of Japan, Journal*, vol. 50, Oct. 1981, p. 3507-3516. 13 refs.

The scattering of a plane acoustic wave by a vortex ring is analyzed in terms of the Lighthill theory of aerodynamic sound generation. A formula for the scattered pressure is obtained from the term representing the interaction of the sound wave with the flow in the source terms of the inhomogeneous wave equation, and is applied to the case of scattering by a circular vortex ring in translational motion. Scattering amplitudes and cross sections are evaluated numerically for the case of slow motion. The total scattering cross section is found to depend not only on the wavelengths of the incident wave, but on the Mach number and direction of a vortex motion. A comparison reveals the scattering power of the vortex ring to be small in relation to that of a solid sphere of the same size. S.C.S.

A82-16153 **Effect of fleet size on estimates of safety against airframe fatigue (Vliv velikosti flotily na odhad unavove spolehlivosti draku letounu).** V. Nejedly. *Zpravodaj VZLU*, no. 3, 1981, p. 111-126. 22 refs. In Czech.

A method is proposed for determining the effect of fleet size on the values of safety coefficients used for aircraft service life estimation. The proposed theoretical solution is based on a statistical analysis of the fatigue damage sequence. Results are presented in a graphical form convenient for practical applications. V.L.

A82-16164 **The application of programmable pocket calculators for computations during survey flights.** H. C. Zorn (International Institute for Aerial Survey and Earth Sciences, Enschede, Netherlands). *ITC Journal*, no. 3, 1981, p. 308-333.

Computation during survey flights can be effectively achieved using a programmable pocket calculator such as the Hewett-Packard C41 model. Using this calculator, formulas and programs have been developed for computing survey turns; wind star; heading and ground speed, given wind vector and required course; pressure altitude required to reach required true altitude, and true airspeed given indicated airspeed, air temperature, and pressure altitude. Other potential applications include the conversion of latitude and longitude to UTM zone and coordinates, and great circle and loxodrome computations. S.C.S.

A82-16172 **Supersonic nozzles without shocks.** M. Burnat (Warszawa, Uniwersytet, Warsaw, Poland). *Archiwum Mechaniki Stosowanej*, vol. 33, no. 1, 1981, p. 117-132. 7 refs.

The Busemann hodograph technique is extended to three-dimensional flows of ideal gases. By using the proposed method of Bernoulli manifolds, it is shown that there exists a wide class of nozzles which transform one uniform supersonic flow into another one without shock. The present analysis can provide a basis for a numerical method aimed at constructing nozzles with specified characteristics. V.L.

A82-16174 **Improvement of the first-ply-failure strength in laminates by using softening strips.** C. T. Sun (Purdue University, West Lafayette, IN) and P. M. Voit. *Composites Technology Review*, vol. 3, Fall 1981, p. 109-113. U.S. Department of Transportation Contract No. RC-92004.

Results of a study of softening strips for various laminates are reported. Baseline systems, all graphite/epoxy laminates, were subjected to stress analysis by means of a finite element program using equivalent elastic constants, with a maximum stress criterion of the first ply failure. Softening strips were added and the tests were repeated. The strip reduced the stress concentration in notched laminated composites and increased the load carrying capability for the first ply failure. It is noted that stresses in individual plies must be calculated to determine the ply failure strength, and also that the width of the softening strip significantly affects the load-carrying capability of laminates. The results are applicable to aircraft structures with fastener holes subject to stress concentrations. M.S.K.

A82-16178 **The Federal Radionavigation Plan.** W. K. Mey (U.S. Coast Guard, Washington, DC). *(Institute of Navigation, Annual Meeting, Annapolis, MD, June 9-11, 1981.) Navigation*, vol. 28, Fall 1981, p. 231-246.

Policies and plans for the U.S. radionavigation services which are delineated by the Federal Radionavigation Plan are described. Areas of authority and responsibility as well as management structure for defining cost requirements and cost-effective operation are provided, along with various navigation phases and current and future requirements for each phase. Federally operated systems with a high degree of common use, both military and civil, including Loran-A, Loran-B, Omega, VOR, VOR/DME, VORTAC, TACAN, ILS, TRANSIT, MLS, Radiobeacons, and the Navstar GPS are examined for a suitable mix to satisfy user requirements. A preliminary recommendation for the future navigation mix will be issued by the DOD/DOT in 1983, and a decision at the national level will be forthcoming in 1986. It is noted that maritime navigation is tending toward a minimum number of systems, while aviation has witnessed heavy investments in VOR/DME. M.S.K.

A82-16187 **Determination of the flammability characteristics of aerospace hydraulic fluids.** C. E. Snyder, Jr. (USAF, Materials Laboratory, Wright-Patterson AFB, OH), A. A. Krawetz, and T. Tovrog (Phoenix Chemical Laboratory, Inc., Chicago, IL). *(American Society of Lubrication Engineers, Annual Meeting, 35th, Anaheim, CA, May 5-8, 1980.) Lubrication Engineering*, vol. 37, Dec. 1981, p. 705-713; Discussion, p. 713, 714.

The hazards associated with the flammability characteristics of aerospace hydraulic fluids are well known. In an effort to reduce these hazards, commercial airlines converted to the use of a phosphate-ester-based, fire-resistant hydraulic fluid with the advent of jet aircraft in the early 1950s. More recently, some of the military aircraft were converted to a compatible, synthetic-hydrocarbon-based hydraulic fluid for the same reason. The flammability characteristics of these and other aerospace hydraulic fluids and test methods used to determine them are discussed. Since a deficiency exists in the area of determination of the flame and/or fire-propagation characteristics of fluids and lubricants, a new test method was developed and is described. The degree of correlation of the data from this test method with other flammability tests is discussed. (Author)

A82-16267 † **An experimental study of the combustion of liquid hydrocarbon fuel sprayed into a diffusion hydrogen-air jet (Eksperimental'noe issledovanie goreniia zhidkogo uglevodorodnogo topliva raspylennogo v diffuzionnom vodorodno-vozdushnom fakele).** Iu. M. Annushkin and G. F. Maslov. *Fizika Goreniia i Vzryva*, vol. 17, Sept.-Oct. 1981, p. 34-38. 7 refs. In Russian.

Simultaneous combustion of liquid hydrocarbon fuel and gaseous hydrogen has been investigated experimentally using a coaxial jet placed in an air stream along the central axis of a subsonic wind tunnel of 160 mm diameter. It is shown that when the liquid fuel is sprayed into the stream, stable combustion with moderate flame lengths is achieved in a high-velocity air stream even at low hydrogen concentrations. V.L.

A82-16289 † **Mechanism for the elimination of instability in a shimmy problem (Mekhanizm ustraneniia neustoichivosti v zadache o shimmi).** L. G. Lobas and N. V. Nikitina (Akademiia Nauk Ukrainskoi SSR, Institut Mekhaniki, Kiev, Ukrainian SSR). *Matematicheskaia Fizika*, no. 30, 1981, p. 24-28. In Russian.

A theoretical study is presented of a square-law damper suitable for reducing the shimmy of a landing gear strut. Numerical integration shows that the square-law damper leads to the stabilization of self-oscillations, which are then reduced by dry friction. B.J.

A82-16290 † **Self-oscillations of the front caster wheel strut for a given track width under the assumption of the wheel drift hypothesis (Avtokolebaniia orientiruiushcheisia stoiki shassi pri zadannoi vysote kolesa v predpolozhenii gipotezy uvoda).** L. G. Lobas (Akademiia Nauk Ukrainskoi SSR, Institut Mekhaniki, Kiev, Ukrainian SSR). *Matematicheskaia Fizika*, no. 30, 1981, p. 28-34. In Russian.

A theoretical analysis of the self-oscillations of a front caster wheel strut is presented. The dependence of the limit-cycle amplitude on the characteristics of a square-law damper connected in parallel to the elastic element is determined. Numerical results are presented on the occurrence of self-oscillations at velocities above the critical one. B.J.

A82-16335 **FILE-IB aircraft flight test program.** H. M. Thomas (Martin Marietta Aerospace, Denver, CO). In: Guidance and control 1981; Proceedings of the Annual Rocky Mountain Guidance and Control Conference, Keystone, CO, January 31-February 4, 1981. San Diego, CA, Univelt, Inc., 1981, p. 363-378. 5 refs. (AAS 81-041)

The Feature Identification and Location Experiment (FILE-IB) is an earth observation experiment, which was successfully flown on the NASA CV-990 aircraft. The FILE-IB classifies earth scenes into four categories: water, bare land, vegetation, and cloud/snow. The FILE system consists of three major elements: electronics for experiments control, sensors to provide multispectral image data, and a buffer memory and magnetic tape recorder for data storage. The sensors have two silicon-charged coupled device television cameras, one for the 650 nanometer (VR) band, and the other for the 850 nanometer (NIR) band. The data, obtained during eight flight missions over low altitude regions of the U.S. west coast, were analyzed on both a micro and a macro scale: the micro scale analysis, which concentrates on individual scenes, identifies specific classification problems; the macro scale analysis, operating on the statistics for the population of all the scenes, ensures that the algorithm performs well over a variety of scenes. J.F.

A82-16404 # **Direct approach to aerodynamic design problems.** W. C. Chin. *ASME, Transactions, Journal of Applied Mechanics*, vol. 48, Dec. 1981, p. 721-728. 11 refs.

'Direct' small disturbance approaches to inviscid aerodynamic 'inverse' or 'design' problems in two- and three-dimensional subsonic, supersonic, and transonic flow are presented which extend the stream function method of Chin and Rizzetta (1979). The shape solutions generally involve nonlinear differential equations of mixed type for scalar 'streamlike' functions. Dualities relating the analysis problem for camber to the design problem for thickness and the design problem for camber to the analysis problem for thickness are given for planar flow; both closed trailing edges and cusped ones, which are generally opened and which model the displacement effects of viscous wakes, are treated. C.R.

A82-16417 # **Resonant whirling of aircraft propeller-engine systems.** S. H. Crandall and J. Dugundji (MIT, Cambridge, MA). *ASME, Transactions, Journal of Applied Mechanics*, vol. 48, Dec. 1981, p. 929-935. 8 refs.

At a critical speed, a light aircraft can experience severe vibrations in steady flight in which the propeller blades vibrate at one frequency while the engine block vibrates at a lower frequency. A model is presented which explains this phenomenon. A three-bladed propeller-engine system is considered to have six rigid-body degrees of freedom plus six blade vibration degrees of freedom. This system is analyzed and simplified by introducing a constraint based on observation of the flight phenomenon. Multiblade coordinates are introduced and a linear eigenvalue problem is derived which describes whirling motions of the engine coupled to progressive waves of blade deformation which circle the propeller disk. These whirling motions are excited by harmonics of the transverse forces on the engine due to the explosion gas pressures in the cylinders. The effects of varying the propeller blade pitch angle are studied and a high-speed instability mechanism is examined. (Author)

A82-16428 # **Cavitation inception in spool valves.** C. S. Martin (Georgia Institute of Technology, Atlanta, GA), H. Medlarz (Karlsruhe, Universitaet, Karlsruhe, West Germany), D. C. Wiggert (Michigan State University, East Lansing, MI), and C. Brennen (California Institute of Technology, Pasadena, CA). *ASME, Transactions, Journal of Fluids Engineering*, vol. 103, Dec. 1981, p. 564-575; Discussion, p. 575, 576. 40 refs. Contract No. F33615-77-C-2036.

Cavitation has been investigated in directional control valves in order to identify damage mechanisms characteristic of components of aircraft hydraulic systems. Tests have been conducted in a representative metal spool valve and in a model three times larger. Data taken under noncavitating conditions with both valves showed that the position of the high-velocity annular jet shifts orientation, depending upon valve opening and Reynolds number. By means of high-frequency response pressure transducers strategically placed in the valve chamber cavitation could be sensed by the correlation of noise with a cavitation index. The onset of cavitation can be detected by comparing energy spectra for a fixed valve opening and a constant discharge. Another sensitive indicator of cavitation inception is the ratio of cavitating to noncavitating spectral densities. The incipient cavitation number as defined in this investigation is correlated with the Reynolds number for both valves. (Author)

A82-16432 # **Aerodynamic effects of shape, camber, pitch, and ground proximity on idealized ground-vehicle bodies.** A. R. George (Cornell University, Ithaca, NY). *ASME, Transactions, Journal of Fluids Engineering*, vol. 103, Dec. 1981, p. 631-637; Discussion, p. 637, 638. 17 refs.

A82-[illegible] **Applications for hypersonic Waverider spacecraft.** D. Lunan. *British Interplanetary Society, Journal (Space Chronicle)*, vol. 35, Jan. 1982, p. 46-47. 11 refs.

The use of the Waverider concept for an atmospheric entry vehicle is discussed. The Waverider has a flat upper surface, a straight leading edge, and anhedral 'V' shaped wings. Entering an atmosphere at near-orbital speed, the craft would fly with nose-up at a high angle of incidence, riding a plasma shock wave, heating to an equilibrium temperature of 1500 C, and offer the opportunity for a low-speed landing at a wider choice of sites than the Shuttle. The flat upper surface protects against radio black-out and can be used as a platform for planetary exploration instruments. Martian aerographic, and Venus and Jupiter missions are examined, noting that the Waverider would probably never land on Venus and Jupiter due to its aerodynamic characteristics and the densities and wind speeds of the two planets' atmospheres. The use of mass-driver launched Waveriders to deliver raw materials directly from the moon to earth is also explored. D.H.K.

A82-16527 **Management of a large avionics project.** H. R. Sandilands (Marconi Avionics, Ltd., Hemel Hempstead, Herts., England) and B. Taylor (Marconi Avionics, Ltd., St. Albans, Herts., England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing*, vol. 128, pt. F, no. 7, Dec. 1981, p. 408-411.

The management of a major avionics project is discussed, using as an example the Airborne Early Warning Nimrod Mission System Avionics project, sponsored by the UK Ministry of Defence. A multilayer project family tree is outlined; the family tree structure is the basis for the identification and interrelation of all the elemental and incremental tasks which must be performed to implement the project. It serves to allocate managerial responsibility for conduct and achievement on a direct, one-to-one basis. It is fundamental to all management and control activities, such as cost and timescale estimation and attribution, preparation of program networks, identification of milestones and key events, allocation of resources high angles of attack subject to finite-amplitude disturbances in pitch is studied using bifurcation theory, taking account of the interactions between the pitching motion and the unsteady flow. The aerodynamic responses to large-amplitude slow oscillations of the aircraft are obtained from that of infinitesimal amplitude case. Increasing the angle of attack past some critical angle for which the damping vanishes, the steady flight becomes unstable and Hopf bifurcation sets in, resulting in a periodic motion. A simple criterion in terms of the aerodynamic coefficients is given for determining the stability of the bifurcating period motion. For supersonic/hypersonic flat plate airfoils the bifurcating periodic motion is found to be unstable. This implies that when the angle of attack is increased past that of neutral damping, there will be drastic changes of the motion of the aircraft from its steady flight condition at the critical angle, including, e.g. hysteresis. (Author)

A82-17864 # **Aerodynamics of tactical weapons to Mach number 8 and angle-of-attack of 180 deg.** L. Devan, L. A. Mason, and F. G. Moore (U.S. Navy, Naval Surface Weapons Center, Dahlgren, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0250.* 13 p. 14 refs. Army-sponsored research. Navy Task RF32-391-801; SEA Task SF32392-591; SEA Task SR02302.

The Naval Surface Weapons Center Aeroprediction Code has been extensively applied to the prediction of static and dynamic aerodynamics of missile configurations. Major extensions have recently been made to the code to extend its capability to freestream Mach number between 0 and 8 and angles of attack between 0 and 180 deg, and also to improve the transonic, inviscid, body-alone, static, aerodynamic predictions and the dynamic derivative predictions for all Mach numbers. The theoretical basis for the code extensions are outlined and previous methods are briefly reviewed. The code is evaluated through comparisons of computational examples with experiment for body-alone, body-tail and body-tail-canard configurations. The speed and accuracy of the code are ideal for use in preliminary design. (Author)

A82-17865 # **Relaxation solution for viscous transonic flow about fighter-type forebodies and afterbodies.** R. R. Cosner (McDonnell Aircraft Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0252.* 10 p. 12 refs.

The velocity-splitting method for solving the Navier-Stokes equations has been formulated into a procedure to predict external 3-D flowfields at subsonic and transonic speeds. A wide range of geometry can be treated, including realistic fighter-type forebody and afterbody configurations. Accurate results for pressure and drag have been obtained for several configurations at transonic speeds, including cases in which the pressure field is modified substantially by boundary layer separation. The procedure has demonstrated the needed accuracy, versatility, reliability, and economy to be a practical engineering tool. (Author)

A82-17866 # **Performance calibration results for a Compact Multimission Aircraft Propulsion Simulator.** C. D. Wagenknecht, G. E. Hoff (General Electric Co., Cincinnati, OH), and T. J. Norbut (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0254.* 12 p. 9 refs.

Experimental performance data were obtained for a Compact Multimission Aircraft Propulsion Simulator configured with dry and reheat exhaust nozzles simulating a broad range of advanced multimission aircraft propulsion system cycles. Exhaust nozzles, pancake mixers, and circular arc venturi flow meters were calibrated over the expected range of operation prior to simulator testing. Agreement of the C-MAPS performance results with the calibration data are presented in order to assess methods for determining installed simulator inlet airflow. Installed operability considerations with regard to cycle simulation, model scaling, and aircraft integration are discussed. The C-MAPS test program demonstrated a 20 percent improvement in engine pressure ratio simulation capability relative to a prototype design. This was accomplished for the 1.65 lb/sec. C-MAPS in a compact size equivalent to a 36 percent overall length reduction and a 21 percent maximum diameter reduction. (Author)

A82-17867 # **Digital test pilot concept.** W. J. Bezdek (McDonnell Aircraft Co., St. Louis, MO) and R. T. Galloway (U.S. Navy, Naval Training Equipment Center, Orlando, FL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0259.* 12 p. 9 refs.

A series of automated digital tests have been developed to verify the fidelity of aircraft systems, performance, and flying qualities for aircraft models developed for man-in-the-loop simulation. The aircraft digital tests include time to accelerate/decelerate, level turning performance, time to climb/descend, steady state trim, dynamic longitudinal stability, static and dynamic lateral-directional stability, lateral control effectiveness, and engine operation. The implementation of the test driver equations, verification of the test methods and comparisons with other validation methods are described. Examples using F-4J/S flight test data are used to demonstrate the concept. (Author)

A82-17868 * # **Real-time simulation of helicopter IFR approaches into major terminal areas using RNAV, MLS, and CDTI.** L. Tobias, H. Q. Lee, L. L. Peach (NASA, Ames Research Center, Moffett Field, CA), F. M. Willett, Jr., and P. J. O'Brien (FAA, Technical Center, Atlantic City, NJ). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0260.* 13 p. 11 refs.

Helicopter IFR routes at hub airports have been investigated in an air-traffic-control system simulation involving a piloted helicopter simulator, computer-generated air traffic, and air traffic controllers. Problems studied included: (1) pilot acceptance of the approach procedure and tracking accuracy; (2) ATC procedures for handling a mix of helicopter and fixed-wing traffic; and (3) utility of the Cockpit Display of Traffic Information (CDTI) for the helicopter. Results indicate that the helicopter routes were pilot acceptable and were noninterfering with fixed-wing traffic. Merging and spacing maneuvers using CDTI were successfully carried out by the pilots, but controllers had some reservations concerning CDTI. (Author)

A82-17874 # **Icing analysis of an unprotected aircraft radome.** J. Stone and R. Ross (Ross Aviation Associates, Sedgwick, KS). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0281.* 6 p.

Artificial icing tests were conducted to determine the rate of ice accretion on an unprotected aircraft radome. These data are correlated with accepted means of calculating water catch rate. The theoretical method of calculating water catch rate is subsequently modified to produce a more accurate prediction technique. A method is also developed to predict the thickness distribution of the accumulated ice on the radome. Since fully descriptive icing tunnel data does not exist for radome shapes, assumptions are made concerning the shape of the forward fuselage in the determination of the average collection efficiency. Other assumptions, such as ice density and the amount of water catch that freezes, are made to give the highest ice accumulation. (Author)

A82-17875 # **A Microwave Ice Accretion Measurement Instrument - MIAMI.** B. Magenheim and J. K. Rocks (Ideal Research, Inc., Rockville, MD). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0285.* 9 p.

A Microwave Ice Accretion Measurement Instrument (MIAMI), controlled by a microprocessor, has been developed that can: (1) detect the presence of ice and sound an alarm; (2) measure and digitally display the ice thickness and ice accretion rate; (3) plot the ice thickness and accretion rate on a pen recorder; (4) log and printout a permanent record of the ice thickness and ice accretion rate versus time; and (5) store data for delayed time statistical analysis and printout. The MIAMI was tested in the NASA Lewis Research Center's Icing Research Tunnel, demonstrating its ability to measure ice growth on a two-dimensional air foil. The MIAMI transducer is constructed from solid-state components, all of which have a low mass and are ruggedly built. The device may be mounted nonintrusively on any part of the aircraft skin, including the rotor blades and engine inlets. J.F.

A82-17894 * # **The NASA MERIT program - Developing new concepts for accurate flight planning.** R. Steinberg (NASA, Lewis

Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0340*. 8 p.

It is noted that the rising cost of aviation fuel has necessitated the development of a new approach to upper air forecasting for flight planning. It is shown that the spatial resolution of the present weather forecast models used in fully automated computer flight planning is an important accuracy-limiting factor, and it is proposed that man be put back into the system, although not in the way he has been used in the past. A new approach is proposed which uses the application of man-computer interactive display techniques to upper air forecasting to retain the fine scale features of the atmosphere inherent in the present data base in order to provide a more accurate and cost effective flight plan. It is pointed out that, as a result of NASA research, the hardware required for this approach already exists. C.R.

A82-17895 # **Minimum cost atmospheric cruise control - Most efficient airspeed for a given wind component.** C. L. Chandler and C. J. Emmons (Delta Air Lines, Inc., Atlanta, GA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0341*. 4 p.

Attention is called to the fact that many airlines overlook the effect of winds when setting the cruise speeds that will produce the most economical speed schedule for a flight. It is shown through calculations that as a headwind gets stronger the Mach number should be increased or at least maintained. Conversely, as the tailwinds increase in strength, the Mach number should be reduced. Another advantage of the method proposed is the improvement that would be seen in on-time performance by compensating for the winds with the wider use of Mach numbers. C.R.

A82-17896 * # **The influence of turbulence models on computer-simulated aircraft landing.** W. Frost (Tennessee, University, Tullahoma, TN), S.-T. Wang (FWG Associates, Inc., Tullahoma, TN), and D. W. Camp (NASA, Marshall Space Flight Center, Huntsville, AL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0342*. 4 p. 9 refs. Contract No. NAS8-32692.

Three models of simulated atmospheric turbulence were used to determine their respective influence on a computer-simulated, DC-8 type, aircraft landing. Statistical results based on a sample of 20 simulated landings illustrate the influence of turbulence simulated by the different models. For the same spectrum function, a non-Gaussian turbulence model produces the higher degree of touchdown variability. When different spectrum functions are used the von Karman model induces a smaller standard deviation in position error than the Dryden model. The turbulence energy contained by the higher frequency fluctuation has little effect on the landing position. (Author)

A82-17900 * # **Computations of transonic flow over an oscillating airfoil with shock-induced separation.** W. J. Chyu and K. Kuwahara (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0350*. 11 p. 22 refs.

A numerical study is presented on unsteady transonic flow over an airfoil in pitching oscillation at a moderately high incidence. The study was focused on the effects of unsteady shock-wave/boundary-layer interactions and subsequent flow separations. An implicit finite-difference scheme was used to solve the full time-dependent compressible Navier-Stokes equations in conservation-law form. The algorithm adapted for this study is the Beam-Warming spatially factored scheme. It is, however, constructed in a body-fitted curvilinear coordinate system for efficient unsteady flow computations. The computational results are compared with experimental data measured in the Ames 11- by 11-Foot Transonic Wind Tunnel. (Author)

A82-17901 # **Instantaneous turbulence profiles in the wake of an oscillating airfoil.** J. De Ruyck and C. Hirsch (Brussel, Vrije Universiteit, Brussels, Belgium). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0353*. 13 p. 18 refs. Research supported by the Fonds National de la Recherche Scientifique; Grant No. DAJA37-80-C-0367.

Instantaneous velocity and turbulence profiles are measured in the wake of a NACA 0012 oscillating airfoil. All non-zero Reynolds stresses are determined using a single slanted rotating hot wire measurement technique. Data acquisition is performed through an on-line sampling, digitizing and recording facility. Measurements are made at 0.7, 2, 5, 10 and 20% chord downstream of the trailing edge. The frequency coefficient ranges from 0 to 1.23. Four mean incidences are considered corresponding to no stall, stall onset and light dynamic stall. Results are discussed and compared with steady state results. (Author)

A82-17902 # **Numerical computation of optimal atmospheric trajectories involving staged vehicles.** C. R. Hargraves (Boeing Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0360*. 6 p. 5 refs.

A trajectory optimization procedure is described which can solve practical problems involving staged vehicles or discontinuous equations of motion. It is an extension of a computer code called CTOP (Chebychev Trajectory Optimization Program) which was described by Hargraves et al. (1981). With CTOP, the state and control variables are described as functions of time by patched polynomials. A subset of the patch points (including initial and final time) may be designated as free parameters called events. It is pointed out that discontinuities may occur at events and that the payoff may depend on them. The values of the events are adjusted in order to achieve the desired optimum. Numerical examples are presented. C.R.

A82-17904 # **Constant L/D glide trajectories.** J. L. Raymond (Hughes Aircraft Co., Missile Systems Group, Canoga Park, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0362*. 7 p.

The present paper reviews the phenomenon of constant L/D glide trajectories with the result that new, simple and accurate closed-form expressions are derived. They include relations between glide path angle, altitude, time, velocity, density, and dynamic pressure. Results obtained compare well with those obtained by a digital computer using step-by-step integration of the equations of motion for a point mass. The relations may be used for rapid preliminary design estimates of constant L/D trajectories. (Author)

A82-17905 # **Optimum configuration for a 10 passenger business turbofan jet airplane.** M. Aronson. *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0365*. 11 p. 7 refs.

The optimum external configuration for an airplane which will meet specific design and performance requirements is determined by use of an analytical method which considers systematic variations of wing sweep, thickness ratio, fuselage fineness ratio, cruising speed and design weight. Relationships between the various structural, weight and aerodynamic parameters used in the method are derived. Evaluation of the parameters is then based on limits imposed by current experience and assumptions. The specific design objective in this study was to minimize take-off weight and maximize the cruising speed for a specific range with a designated power plant. The optimum configuration resulting from this study has 38 deg wing sweep and 14.6% wing section thickness, a ramp weight of 21,575 pounds and a range of 2500 n. miles with 10 passengers. Besides providing an optimum design and an analytical method for its determination, the method and a number of the curves can be used to determine configurations which will meet other specific performance requirements. (Author)

A82-17906 # **Optimal trajectories in supersonic flight.** [illegible] Lin (Applied Dynamics International, Ann Arbor, MI). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0366*. 10 p. 5 refs.

A discussion emphasizing the analytic aspect of the theory of the optimal trajectories is presented, beginning with an overview of optimal trajectories in two dimensions. Solving the general problem of optimal trajectories in three dimensions is discussed in detail. Included here are the general properties of optimal trajectories consisting of the integrals of motion and the characteristic features in engine and aerodynamic controls. In addition, the optimality of the wing are investigated in detail. In the case of low frequency oscillations, numerical solution is obtained by the non-steady vortex-lattice method which can be used to calculate the rolling moment aerodynamic derivatives of the wing due to yaw and side slip. Some of the computed results are compared with the experimental results. Author

N82-14071# Arinc Research Corp., Annapolis, Md.
THE USE OF FLIGHT MANAGEMENT COMPUTERS IN AIR CARRIER OPERATIONS IN THE 1980S Interim Report
I. Gershkoff Washington FAA Aug. 1981 113 p refs
(Contract DTFA01-80-C-10030)
(AD-A105621; Rept-1378-11-1-2482; FAA-EM-81-10) Avail: NTIS HC A06/MF A01 CSCL 09/2

The use of on-board flight management computers (FMCs) in air carrier operations has the potential for significant fuel savings. This report assesses the general capabilities of the FMCs currently available. From this information, economic benefits and rates at which aircraft would be equipped were developed. Minimum-cost flight profiles were analyzed for various common conditions to determine the problems associated with incorporating the capabilities of FMCs into a heavy traffic Air Traffic Control environment. GRA

N82-14072# Hamilton Standard, Windsor Locks, Conn.
ADVANCED CRASH SURVIVABLE FLIGHT DATA RECORDER AND ACCIDENT INFORMATION RETRIEVAL SYSTEM (AIRS) Final Report, Oct. 1978 - Dec. 1980
Henry R. Ask, Donald L. White, and Kent E. Berwick Fort Eustis, Va. Army Research and Technology Labs. Aug. 1981 166 p refs
(Contract DAAK51-78-C-0025; DA Proj. 1L1-62209-AH-76)
(AD-A105510; ESP-8109; USAAVRADCOM-TR-81-D-20) Avail: NTIS HC A08/MF A01 CSCL 01/3

The Accident Information Retrieval System, (AIRS) development program consisted of four phases. Design concepts were formulated based on selection and definition of aircraft parameters to be monitored by the AIRS, selection of memory technology, circuit definitions for aircraft interfacing, and studies and tests related to the development of an armored module to protect the memory device. Brassboard electronics were fabricated and tested and software which proved the feasibility of data collection and storage in a solid-state memory device utilizing unique data compression techniques to reproduce critical aircraft flight information was developed and tested. Flight-worthiness assurance tests were performed on the AIRS brassbroad. The hardware was installed in a Sikorsky UH-60A BLACK HAWK helicopter. The system was reviewed for final configuration, risk areas, final size (207 cu. in. or less), weight (less than 9.3 lbs.), and life cost (greater than 10,000 hours MTBF). GRA

N82-14073# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugfuehrung.
ANALYSIS OF TWO AIR TRAFFIC SAMPLES IN THE TERMINAL AREA OF FRANKFURT/MAIN, AUGUST 4TH 1978
Uwe Voelckers, Manfred Schubert, and Albrecht Seyfried 1981 127 p refs In GERMAN
(DFVLR-Mitt-81-12) Avail: NTIS HC A07/MF A01

Two 'arrival peaks' are analyzed. Computer programs used to combine data recorded from several sources are discussed. Traffic analysis includes quantitative evaluation of traffic density, studies of air traffic distributions relating to space and time, investigation of air traffic control procedures, determination of the approach control planning strategies, and a basic investigation of traffic vectoring in the terminal area. The similarities and differences of the two traffic samples are discussed. N.W.

N82-14075*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DESIGN AND IMPLEMENTATION OF A TELECOMMUNICATION INTERFACE FOR THE TAATM/TCV REAL-TIME EXPERIMENT
Joseph D. Nolan Dec. 1981 26 p refs
(NASA-TM-83231; L-15021) Avail: NTIS HC A03/MF A01 CSCL 17G

The traffic situation display experiment of the terminal configured vehicle (TCV) research program requires a bidirectional data communications tie line between an computer complex. The tie line is used in a real time environment on the CYBER 175 computer by the terminal area air traffic model (TAATM) simulation program. Aircraft position data are processed by TAATM with the resultant output sent to the facility for the generation of air traffic situation displays which are transmitted to a research aircraft. E.A.K.

N82-14076# Federal Aviation Administration, Atlantic City, N.J.
IN-SERVICE TESTING OF THE PRECISION APPROACH PATH INDICATOR (PAPI) AT NEWARK INTERNATIONAL AIRPORT, NEW JERSEY Interim Report, Dec. 8, 1980 - Apr. 8, 1981
Bret B. Castle Dec. 1981 11 p
(DOT-081-502-510)
(DOT/FAA/RD-81/95; DOT/FAA/CT-81/79) Avail: NTIS HC A02/MF A01

The Precision Approach Path Indicator (PAPI) tests involving four months of inservice testing at Newark International Airport, New Jersey are presented. Basically, the PAPI was compared against the standard red/white Visual Approach Slope Indicator (VASI) system at a large airport and on a runway with an Instrument Landing System (ILS). The PAPI system was installed in a manner to take care of aircraft of all sizes: that is, different wheel to eye distances. Information was obtained from pilots of large commercial aircraft. Results show that under these conditions about 60 percent of the pilots prefer the PAPI over the VASI system. S.L.

N82-14078*# Ohio Univ., Athens. Avionics Engineering Center.
A PROTOTYPE INTERFACE UNIT FOR MICROPROCESSOR BASED LORAN-C RECEIVER
Stanley M. Novacki, III Nov. 1981 11 p refs
(Grant NGR-36-009-017)
(NASA-CR-164887; TM-82-NASA) Avail: NTIS HC A02/MF A01 CSCL 17G

An inexpensive data/command entry and CRT display system capable of alphanumeric and graphics moe operation and designed to operate in place of a seperate ASCII terminal, is documented. The software to interface this unit to the 6502-based Loran C receiver is also described. The system simplifies receiver operations to a level typical of current avionics systems. N.W.

N82-14079# Mitre Corp., McLean, Va.
REQUIREMENTS FOR INSTRUMENT APPROACHES TO TRIPLE PARALLEL RUNWAYS
T. N. Shimi, W. J. Swedish, and L. C. Newman Jul. 1981 148 p refs
(Contract DTFA01-81-C-10001)
(AD-A105622; MTR-81W146; FAA-EM-81-12) Avail: NTIS HC A07/MF A01 CSCL 01/2

Current ATC procedures do not consider instrument approaches to more than two parallel runways. This document discusses the engineering results of an analysis that examined the technical feasibility of conducting triple parallel instrument approaches as a means of increasing the aircraft flow at congested airports. The technical criteria that were subjected to analysis include the physical characteristics of the airfield, airspace and aircraft mix, surveillance (the radar and display systems), and control (procedures for normal and abnormal operations. The expected performance in safety and capacity was estimated for alternative landing concepts. An analysis was conducted of blunders and evasion strategies. It was found that, for a given configuration, a single blunder recovery strategy could be specified that would produce acceptable separations between aircraft. Missed approaches on triple parallels and pilot acceptance of triple approaches are also discussed. Lastly, recommended requirements and control procedures for triple parallel instrument approaches are presented. Author (GRA)

N82-14080# Mitre Corp., McLean, Va.
REQUIREMENTS FOR INDEPENDENT AND DEPENDENT PARALLEL INSTRUMENT APPROACHES AT REDUCED RUNWAY SPACING
A. L. Haines and W. J. Swedish Washington FAA May 1981 182 p refs
(Contract DTFA01-81-C-10001)
(AD-A105673; MTR-81W15; FAA-EM-81-8) Avail: NTIS

HC A09/MF A01 CSCL 01/2

Independent parallel instrument approaches are conducted today only if the runway centerlines are 4300 ft apart or more. The rationale behind this criterion is reviewed, and the requirements for reducing the criterion to 3000 ft are evaluated. Although some benefit is derived from improvements in navigational accuracy, the performance of the surveillance system has the greatest impact on the required runway spacing. Dependent alternating instrument approaches to parallel runways are also evaluated. Currently such approaches require a runway spacing of 3000 ft or more. The effects of reducing this runway spacing are discussed, especially with regard to blunder recovery. Reducing the runway spacing required for these approaches could increase the arrival capacity and reduce delays at certain airports and would provide increased flexibility for planning new runways. Author (GRA)

N82-14082# Kaman Aerospace Corp., Bloomfield, Conn.

ADVANCED TECHNOLOGY LIGHTWEIGHT GONDOLA SYSTEM EXPERIMENTAL FABRICATION PROGRAM Final Report, Aug. 1979 - Mar. 1981

John D. Porterfield Jul. 1981 133 p refs
(Contract DAAK51-79-C-0036; DA Proj. 1L1-62209-AH-76)
(AD-A104157; R-1630; USAAVRADCOM-TR-81-D-24) Avail: NTIS HC A07/MF A01 CSCL 01/3

Design concept verification hardware for the helicopter external gondola systems (HEGS) 10 and 20 modules, critical element and component fabrication and testing and full-scale HEGS 20 gondola assemblies were accomplished. The HEGS 20 module characteristics demonstrated during design, fabrication, and testing included (1) structural efficiency (2) impact resistance potential, (3) producibility, (4) repairability without post heat treatment, (5) maintenance, (6) functional and structural capabilities, (7) load and unload capabilities, (8) cargo tie-down capabilities, (9) compatibility with automated lifting devices and ground transport equipment, (10) suitability for loading and unloading on uneven terrain, and (11) low weight potential. Author

N82-14083# Army Armament Research and Development Command, Watervliet, N. Y. Geotechnical Lab.

C-5A OPERATIONAL UTILITY EVALUATION SOIL TESTS AND ANALYSIS Final Report, Jun. - Aug. 1980

Robert W. Grau Aug. 1981 74 p refs
(Contract MIPR-F7B13001430001)
(AD-A105558; WES-TR-GL-81-7) Avail: NTIS HC A04/MF A01 CSCL 08/13

The purpose of this report is to present the data collected concerning the ground flotation characteristics of the C-5A aircraft during the C-5A operational utility evaluation test program. This report gives a description of the three test sites selected for this program, a summary of all soil and surface distress measurements taken at each site during aircraft operations, and an analysis of the data. Results of this evaluation test program indicate that 3-in. ruts have little or no effect on the performance of the C-5A aircraft on unsurfaced areas. Author (GRA)

N82-14084# National Aerospace Lab., Amsterdam (Netherlands). Flight Div.

A METHOD FOR MEASURING TAKEOFF AND LANDING PERFORMANCE OF AIRCRAFT, USING AN INERTIAL SENSING SYSTEM

A. Pool, J. L. Simons, G. J. H. Wensink, and A. J. L. Willekens 26 Sep. 1980 10 p refs Presented at AGARD Flight Mech. Panel Symp. on Subsystem Testing and Flight Test Instrumentation, Geilo, Norway, 27-30 Oct. 1980
(NLR-MP-80036-U) Avail: NTIS HC A02/MF A01

An inertial sensing system, STALINS, used to provide trajectory data for takeoff and landing measurement instrument design, is presented. The system specifications based on certification requirements for civil transport aircraft are defined for continuous and rejected takeoff, minimum unstick speed, minimum control speed on the ground, and landing. Calculations are performed using a computer program supplemented by a manual check, giving horizontal distance and height measurements. Data are made available within 24 hours. The method is accurate and is suitable for tests at several airfields, since instrumentation is either onboard already, or easily transported by the aircraft. Author (ESA)

N82-14085*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

A GENERAL AVIATION SIMULATOR EVALUATION OF A RATE-ENHANCED INSTRUMENT LANDING SYSTEM DISPLAY

David A. Hinton Dec. 1981 44 p
(NASA-TP-1950; L-13911) Avail: NTIS HC A03/MF A01 CSCL 01D

A piloted-simulation study was conducted to evaluate the effect on instrument landing system tracking performance of integrating localizer-error rate with raw localizer and glide-slope error. The display was named the pseudocommand tracking indicator (PCTI) because it provides an indication of the change of heading required to track the localizer center line. Eight instrument-rated pilots each flew five instrument approaches with the PCTI and five instrument approaches with a conventional course deviation indicator. The results show good overall pilot acceptance of the display, a significant improvement in localizer tracking error, and no significant changes in glide-slope tracking error or pilot workload. B.W.

N82-14086 Royal Aircraft Establishment, Farnborough (England).

A TRUE AIR SPEED SENSOR FOR MINIATURE UNMANNED AIRCRAFT

J. A. C. Beattie Jun. 1981 11 p refs
(RAE-TM-SPACE-287; BR80018) Copyright. Avail: Issuing Activity

A prototype sensor with digital output is described. Vortex shedding principles are exploited by using a bluff body with end-plates to produce a stable set of vortices alternately from the edges of the body. Vortex production frequency is directly proportional to the speed of the fluid past the body. A pair of printed thick film thermistors detect the vortices. Tests show excellent linearity of response, although sensor geometry, and signal processing electronics can be improved. Author (ESA)

N82-14087# General Electric Co., Cincinnati, Ohio. Aircraft Equipment Div.

ELECTRONIC MASTER MONITOR AND ADVISORY DISPLAY SYSTEM, OPERATIONAL FUCTIONS REPORT Interim Report, Jan. 1979 - Oct. 1980

Oct. 1980 201 p refs
(Contract DAAK80-79-C-0270; DA Proj. 1L2-62202-AH-85)
(AD-A108816; ACS-12-217; AVRADCOM-TR-79-0270-2; IR-2) Avail: NTIS HC A10/MF A01 CSCL 01/3

Basic system operating requirements for an Electronic Master Monitor and Advisory Display System (EMMADS), developed for use on U.S. Army helicopters to reduce crew workload by assuming responsibility for tasks associated with subsystem status monitoring, are described. A baseline for defining the requirements of the feasibility demonstration hardware is provided. EMMADS functions described include examples related to the CH-47C helicopter, the aircraft selected as the basis for the EMMADS feasibility model. Author

N82-14088# Naval Air Development Center, Warminster, Pa.

INVESTIGATION OF FUNCTIONAL COMMONALITY OF AVIONICS SYSTEMS IN NAVAL AIRCRAFT Final Report, Jan. - Sep. 1981

John M. Cunningham 30 Sep. 1981 136 p refs
(W05720000)
(AD-A108603; NADC-81235-20) Avail: NTIS HC A07/MF A01 CSCL 09/3

This report presents the results of a study to determine general requirements for the development of core avionics equipment for common usage by Naval aircraft. The study addresses the core avionics architecture and the relationship between existing core avionics equipment and advanced subsystems under development. The report provides specific recommendations regarding: procurement policies; the application of standards to electronic interfaces; and the development of the basic architectural components. GRA

N82-14089# Southwest Research Inst., San Antonio, Tex.

HELICOPTER MODEL STUDIES FOR ON-BOARD ELECTROSTATIC SENSORS Final Report, 25 Sep. 1979 - 24 Jan. 1981

O. Trenberger, R. M. Duff, and T. R. Owen Fort Eustis, Va. Army Research and Technology Labs. Sep. 1981 288 p refs
(Contract DAAK51-79-C-0063; DA Proj. 1L1-62209-AH-76)

OPTICAL PROPERTIES OF AIRFIELD LIGHTING FIXTURES OF THE ROYAL NETHERLANDS AIRFORCE. PART 1: COLOR MEASUREMENTS
P. Padmos and R. vanLeeuwen 1980 20 p In DUTCH; ENGLISH summary 2 Vol.
(Contract A78/KLu/085)
(IZF-1980-1-Vol-1; TDCK-73414) Avail: NTIS HC A02/MF A01

Airfield lighting fixtures in use in the Royal Netherlands' Airforce were sampled and used to measure to what extent the chromaticity coordinates are corresponding to the NATO-Standardization Agreements. For the yellow and red filters, especially, it is important to measure the chromaticity of the mounted lamp-filter combinations, because heating may cause a considerable shift in chromaticity. For each fixture the measurements were performed at nominal maximum luminous intensity. Moreover, for a number of representative colors, measurements were made at the reduced intensity settings normally in use. Conclusions regarding, rejecting, or accepting are tabulated. Author

N82-15082# Institute for Perception RVO-TNO, Soesterberg (Netherlands).
OPTICAL PROPERTIES OF AIRFIELD LIGHTING FIXTURES OF THE ROYAL NETHERLANDS AIRFORCE. PART 2: INTENSITY MEASUREMENTS
P. Padmos and R. vanLeeuwen 1980 38 p In DUTCH; ENGLISH summary 2 Vol.
(Contract A78/KLu/085)
(IZF-1980-12-Vol-2; TDCK-75011) Avail: NTIS HC A03/MF A01

Most lighting fixtures did not fulfill NATO-Standardization requirements in one or another way. The most conspicuous error was found in a taxiway fixture, where the beam maximum appeared to be directed downwards. Many red filters have a deep red color, which lessens the light output. In most cases a considerable improvement in light output can be obtained by applying a more orange-red-color, for which the color requirements give room. It appears that for some red glass filters the transmission is lowered considerably by heating. Author

N82-15083# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Experimental Aerodynamics.
DEVELOPMENT AND TRIAL OF A ROTARY BALANCE FOR THE 3 m-LOW SPEED WIND TUNNELS IN THE FEDERAL REPUBLIC OF GERMANY Final Report, Dec. 1979
Bernd Schulze Bonn Bundesministerium fuer Forschung und Technologie Jul. 1981 70 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-W-81-022; ISSN-0170-1339) Avail: NTIS HC A04/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 14,70

A rotary balance was developed for determining aerodynamic damping due to rolling by means of a stationary measuring procedure. Due to the uniform rotation around the wind tunnel axis, vortex relaxation effects that might result from oscillatory balances are avoided. Layout, instrumentation, and data processing are described. Results obtained by using the apparatus during different wind tunnel tests with a calibration model correlate well with existing reference data and flight test data. Dynamic stability derivates due to rolling can be measured for angles of attack up to 90 deg and for extreme angles of inclination. Author (ESA)

N82-15111# Fraunhofer-Inst. fuer Naturwissenschaftlich-Technische Trendanalysen, Euskirchen (West Germany).
SENSOR FOOTPRINTS AND HOMING RANGE OF TERMINAL GUIDANCE MUNITION [SENSOR-FOOTPRINT UND NACHLENKBEREICH BEI ENDPHASENGELENKTER MUNITION]
K.-D. Leuthaeuser and H. Wessel Bonn Bundesministerium der Verteidigund 1981 56 p refs In GERMAN Sponsored by Bundesministerium der Verteidigung
(BMVg-FBWT-81-5) Avail: NTIS HC A04/MF A01; DOKZENTBw, Bonn DM 30

The footprints of terminal guidance projectiles were analyzed. These footprints, which correspond to the accessible target range on the surface, depend on the vision range of the sensor and on the homing range of the projectile. The sensor vision range is calculated as a function of trajectory parameters, sensor aperture, and sensor range. The extent of the homing range is determined for the special case of circular trajectories, i.e., proportional navigation, in dependence of flight height, angle of incidence, and maximal transverse acceleration. The resulting footprints are represented in overlay diagrams. Author (ESA)

N82-15277*# Old Dominion Univ., Norfolk, Va. Dept. of Electrical Engineering.
AIRBORNE ANTENNA PATTERN CALCULATIONS Final Report, 1 Nov. 1980 - 31 Oct. 1981
Timothy J. Knerr, Teri M. Owens, and Roland R. Mielke Dec. 1981 322 p refs
(Grant NsG-1655)
(NASA-CR-165059) Avail: NTIS HC A14/MF A01 CSCL 20N

Calculated principal-and off-principal plane patterns are presented for the following aircraft: de Havilland DHC-7, Rockwell Sabreliner 75A, Piper PA-31T Cheyenne, Lockheed Jet Star II, Piper PA-31-350 Navajo Chieftain, Beechcraft Duke B60, Rockwell Commander 700, Cessna Citation 3, Piper PA-31P Pressurized Navajo, Lear Jet, and Twin Otter DHC-6. Author

N82-15313*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH TEMPERATURE ELECTRONIC REQUIREMENTS IN AEROPROPULSION SYSTEMS
William C. Nieberding and J. Anthony Powell *In its* Proc. of The Conf. on High-Temp. Electron. 1981 p 13-16 refs

(E-708) Avail: NTIS HC A07/MF A01 CSCL 09C

The needs for high temperature electronic and electro-optic devices as they would be used on aircraft engines in either research and development applications, or operational applications are discussed. The conclusion reached is that the temperature at which the devices must be able to function is in the neighborhood of 500 to 600 C either for R&D or for operational applications. In R&D applications the devices must function in this temperature range when in the engine but only for a moderate period of time. On an operational engine, the reliability requirements dictate that the devices be able to be burned-in at temperatures significantly higher than those at which they will function on the engine. The major point made is that semiconductor technology must be pushed well beyond the level at which silicon will be able to function. M.G.

N82-15359*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RELATIONS FOR THE THERMODYNAMIC AND TRANSPORT PROPERTIES IN THE TESTING ENVIRONMENT OF THE LANGLEY HYPERSONIC CF4 TUNNEL
Kenneth Sutton Oct. 1981 40 p refs
(NASA-TM-83220) Avail: NTIS HC A03/MF A01 CSCL 20D

Thermodynamic and transport properties of gaseous CF4 that can be used in flow field computer codes and theoretical analyses for comparison of results with experimental data from the Langley Hypersonic CF4 Tunnel are presented. The thermodynamic relations which are based on thermally perfect but calorifically imperfect gas are adequate for the testing environment of the CF4 tunnel and are simpler to use than the imperfect gas relations required to define the complete expansion from the tunnel reservoir. Relations for the transport properties are based on the kinetic theory of gases in which published experimental data are used in the derivation of the relations. Extensive experimental data were located for viscosity and the derived relation should provide values for viscosity with errors of less than 1 percent. The experimental data for thermal conductivity were limited with significant disagreement between the various sources. The derived relation will probably provide values for the thermal conductivity with errors of no more than 5 percent which is within the accuracy of the experimental data. M.D.K.

N82-15466*# EG and G Washington Analytical Services Center, Inc., Pocomoke City, Md.
A GLOBAL ATLAS OF GEOS-3 SIGNIFICANT WAVEHEIGHT DATA AND COMPARISON OF THE DATA WITH NATIONAL BUOY DATA
J. D. McMillan Wallops Island, Va. NASA. Wallops Flight Center Nov. 1981 163 p refs

(Contract NAS6-2639)
(NASA-CR-156882) Avail: NTIS HC A08/MF A01 CSCL 08C

The accuracy of the GEOS-3 significant waveheight estimates compared with buoy measurements of significant waveheight were determined. A global atlas of the GEOS-3 significant waveheight estimates gathered is presented. The GEOS-3 significant waveheight estimation algorithm is derived by analyzing the return waveform characteristics of the altimeter. Convergence considerations are examined, the rationale for a smoothing technique is presented and the convergence characteristics of the smoothed estimate are discussed. The GEOS-3 data are selected for comparison with buoy measurements. The GEOS-3 significant waveheight estimates are assembled in the form of a global atlas of contour maps. Both high and low sea state contour maps are presented, and the data are displayed both by seasons and for the entire duration of the GEOS-3 mission. E.A.K.

N82-15986# Prins Maurits Lab. TNO, Rijswijk (Netherlands). Inst. voor Chemische en Technologische Research.
POLLUTION OF THE SOIL BY AVIATION GASOLINE
A. Verweij Aug. 1979 26 p ref In DUTCH; ENGLISH summary
(Contract A78/KL4/146)
(PML-1979-41; TDCK-73390) Avail: NTIS HC A03/MF A01

A literature search was conducted to determine the effects of aviation gasoline spills and more general oil spills on the environment and on the condition of oil storage tanks. Remedial measures are presented. Attention is given to natural restoration processes as well as to actions to speed up these processes. Author

N82-15994*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
OPTICAL INFORMATION PROCESSING FOR AEROSPACE APPLICATIONS
Dec. 1981 347 p refs Conf. held in Hampton, Va., 18-19 Aug. 1981
(NASA-CP-2207; L-15016) Avail: NTIS HC A15/MF A01 CSCL 20F

Current research in optical processing is reviewed. Its role in future aerospace systems is determined. The development of optical devices and components demonstrates that system concepts can be implemented in practical aerospace configurations.

N82-15997*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ROLE OF OPTICAL COMPUTERS IN AERONAUTICAL CONTROL APPLICATIONS
Robert J. Baumbick *In* NASA. Langley Research Center Opt. Inform. Process. for Aerospace Appl. Dec. 1981 p 33-43

Avail: NTIS HC A15/MF A01 CSCL 20F

The role that optical computers play in aircraft control is determined. The optical computer has the potential high speed capability required, especially for matrix/matrix operations. The optical computer also has the potential for handling nonlinear simulations in real time. They are also more compatible with fiber optic signal transmission. Optics also permit the use of passive sensors to measure process variables. No electrical energy need be supplied to the sensor. Complex interfacing between optical sensors and the optical computer is avoided if the optical sensor outputs can be directly processed by the optical computer. S.L.

N82-15998# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Wessling (West Germany). Inst. fuer Physik der Atmosphaere.
THE OPTICAL RECOGNITION OF SEA TARGETS AS A FUNCTION OF SURROUNDING AND OBSERVATION PARAMETERS IN AIR TO WATER OBSERVATIONS
Hans-Eberhard Hoffmann Bonn Bundesministerium der Verteidigung 1981 41 p refs In GERMAN; ENGLISH summary
(BMVG-FBWT-81-10) Avail: NTIS HC A03/MF A01; DOKZENTBW, Bonn DM 30

The influence of environmental and observation parameters on visibility ranges, maximum detection range, and maximum identification range were determined. The determination of the visibility ranges and the measurements of environmental parameters took place from helicopters. On the basis of the test results the influence of the following parameters on visibility ranges is shown: visual range, illumination, flight altitude, and environmental brightness as environmental parameters; and naked eye, light-intensifier, night goggles, limitation of field of view as observation parameters. T.M.

N82-16004# Dayton Univ., Ohio. Research Inst.
THE INFLUENCE OF AERONAUTICAL R&D EXPENDITURES UPON THE PRODUCTIVITY OF AIR TRANSPORTATION Final Report, 1926-1976
Ralph C. Lenz, John A. Machnic, and Anthony W. Elkins Jul. 1981 248 p refs
(Grant NSF SRS-79-10087)
(PB81-247140; UDR-TR-81-72; NSF/SIU-81-1) Avail: NTIS HC A11/MF A01 CSCL 05A

The impact which aeronautical R&D expenditures have had upon productivity growth in the air transportation industry over the 50-year period from 1926 to 1976 is examined. Quantitative analyses of the returns on U.S. investments in aeronautical R&D show that the net gains from such investments are very large in comparison with standard commercial opportunities during the same period. The gains were distributed primarily to the traveling public and, to a lesser extent, to the airline employees. Author

N82-16005* National Aeronautics and Space Administration. Washington, D. C.
INDEX TO NASA NEWS RELEASES AND SPEECHES, 1980
1981 131 p
Avail: NTIS HC A07/MF A01 CSCL 05B

A listing is provided of 201 news releases distributed by the Office of Public Affairs, NASA Headquarters and 10 selected speeches presented by Headquarters staff in 1980. Subject and name indexes are arranged alphabetically. Indexes to titles, news release numbers and accession numbers are arranged numerically. A.R.H.

N82-16008*# Helicopter Association of America, Washington, D. C.
COMMUNITY ROTORCRAFT AIR TRANSPORTATION BENEFITS AND OPPORTUNITIES Final Report, Dec. 1981
Glen A. Gilbert, Darral J. Freund, Robert M. Winick, Nicholas J. Cafarelli, Richard F. Hodgkins, Tirey K. Vickers et al Dec. 1981 181 p refs
(Contract NAS2-10788)
(NASA-CR-166268) Avail: NTIS HC A09/MF A01 CSCL 01C

Information about rotorcraft that will assist community planners in assessing and planning for the use of rotorcraft transportation in their communities is provided. Information useful to helicopter researchers, manufacturers, and operators concerning helicopter opportunities and benefits is also given. Three primary topics are discussed: the current status and future projections of rotorcraft technology, and the comparison of that technology with other transportation vehicles; the community benefits of promising rotorcraft transportation opportunities; and the integration and interfacing considerations between rotorcraft and other transportation vehicles. Helicopter applications in a number of business and public service fields are examined in various geographical settings. R.J.F.

N82-16022*# National Aeronautics and Space Administration, Washington, D. C.
AERONAUTICS AND SPACE REPORT OF THE PRESIDENT, 1980 ACTIVITIES
1981 108 p
(NASA-TM-84078) Avail: NTIS HC A06/MF A01 CSCL 05A

The year's achievements in the areas of communication, Earth resources, environment, space science, transportation, and space energy are summarized and current and planned activities in these areas at the various departments and agencies of the Federal Government are summarized. Tables show U.S. and world spacecraft records, spacecraft launchings for 1980, and scientific payload and probes launched 1975-1980. Budget data are included. A.R.H.

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Stress intensity factor measurements in composite sandwich structures
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[AIAA PAPER 82-0017] A82-17734
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A82-17606
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Coordinate transformation in PLRS --- algorithm and error analysis of Position Location and Reporting System
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Corrosion inhibiting engine oils
[AD-A106127] N82-14099
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COUPLED MODES
Stability analysis of the twin mode model of coupled flexion/torsion vibrations in turbofans
N82-15057
CRACK PROPAGATION
Crack edge instability - A criterion for safe crack propagation limit in thin sheets
A82-17243
Inclusions and service induced cracks in a mature population of gas turbine engine bearings
[ASME PAPER 81-LUB-48] A82-18444
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A method for locating aircraft wing damage by nonlinear vibration analysis
A82-17116
CRUISE MISSILES
Performance considerations in the design of subsonic cruise missiles
[AIAA PAPER 82-0371] A82-17911
CRUISING FLIGHT
Energy savings with today's technology --- aircraft fuel management through in-flight monitoring
A82-17282
Minimum cost atmospheric cruise control - Most efficient airspeed for a given wind component
[AIAA PAPER 82-0341] A82-17895
CRYOGENIC ROCKET PROPELLANTS
Technological innovation for success - Liquid hydrogen propulsion
A82-16734
CRYOGENIC WIND TUNNELS
Recent sidewall boundary-layer investigations with suction in the Langley 0.3-m Transonic Cryogenic Tunnel
[AIAA PAPER 82-0234] A82-17858
Research on an induction driven cryogenic wind tunnel
N82-14394
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Cavitation inception in spool valves
A82-16428
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Calculation of the stability of crosswise-reinforced cylindrical shells
A82-18621

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Foreign object damage in naval aircraft engines
[AD-A105787] N82-14098
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Development and trial of a rotary balance for the 3 m-low speed wind tunnels in the Federal Republic of Germany
[BMFT-FB-W-81-022] N82-15083
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[NASA-TM-81368] N82-15079
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[AD-A105510] N82-14072
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Position extrapolation quality calculation for inertial and Doppler-AHRS navigation systems
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Comparison of experimental and theoretical turbulence reduction characteristics for screens, honeycomb, and honeycomb-screen combinations
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Flight mechanics - Modern aircraft design and control concepts --- German book
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[ASME PAPER 81-LUB-12] A82-18429
Helicopter landing gear design and test criteria investigation
[AD-A105512] N82-15035

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Experimental structural testing on a composite aircraft canard and its applications
[AIAA PAPER 82-0409] A82-17930

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Optimal subsonic diffuser wall design for arbitrary entry conditions
[AIAA PAPER 82-0132] A82-17800

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Widely-spaced co-axial jet, diffusion-flame combustor - Isothermal flow calculations using the two-equation turbulence model
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Role of optical computers in aeronautical control applications
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[DFVLR-MITT-81-09] N82-15038

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[NASA-CR-164807] N82-14078
A general aviation simulator evaluation of a rate-enhanced instrument landing system display
[NASA-TP-1960] N82-14005
Ruggedized minicomputer hardware and software topics, 1981: Proceedings of the 4th ROLM MIL-SPEC Computer User's Group Conference
[NASA-CP-2206] N82-14029

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Sensor footprints and homing range of terminal guidance munition
[BMVG-FBWT-81-5] N82-15111

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Ground test of a large scale 'D' vented thrust deflecting nozzle
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Comparison of experimental and theoretical turbulence reduction characteristics for screens, honeycomb, and honeycomb-screen combinations
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Accelerated development and flight evaluation of active controls concepts for subsonic transport aircraft. Volume 1: Load alleviation/extended span development and flight tests
[NASA-CR-159097] N82-15076

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Water ingestion into jet engine axial compressors
[AIAA PAPER 82-0196] A82-17836

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N82-15055

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preparation of management information, as well as progress, cost and performance reporting. It may even play a future role in forming the contract with the customer. J.F.

A82-16558 **Special problems associated with aircraft radomes.** D. A. Conti (British Aerospace Public, Ltd., Co., Dynamics Group, Stevenage, Herts., England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 412-418. 13 refs.

The paper discusses the design and manufacturing aspects of nose radomes for high-speed aircraft. Aircraft radomes are an acceptable comprise of the conflict between the electrical, structural, environmental and aerodynamic requirements. The paper reviews the requirements placed on the design and summarizes the basic radome design and construction methods, as applied in current radome technology, concluding with an examination of the shortcomings of existing radomes and an indication of possible solutions to current problems. (Author)

A82-16559 **Advanced cockpit for tactical aircraft.** G. Roe (British Aerospace Public, Ltd., Co., Aircraft Group, Brough, Humberside, England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 419-426. 8 refs.

The progressive development of aircraft systems and changes in their requirements over the past 20 years are shown to have affected the cockpit of the Harrier aircraft. Several mature technologies, as well as several which are likely to mature within the next ten years are described. Ways in which these technologies may be used to redesign an all-electronic cockpit, while still meeting the pilot's basic need to remain in overall control of the aircraft and its system, are discussed. A final advanced cockpit design is offered: it consists of a side-mounted flight controller and sliding-throttle arrangement, with the appropriate controls and switches to facilitate a hands-on-throttle-and-stick operation. All once-aflight-type switches are located on the right console, reducing hands-off stick operation, while all major system panels are located on the left console. When possible, all controls are located on a priority and frequency-of-use basis. J.F.

A82-16560 **Techniques for overhead-wire detection.** K. E. Potter (Royal Signals and Radar Establishment, Malvern, Worcs., England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 427-432.

The paper describes three wire detection techniques. A millimetre-wave pulsed radar system operating on the grating returns from wires with a regular mechanical structure is discussed. Experimental evidence at 35 GHz proves the operational philosophy of the system and suggests that higher frequencies would produce more successful results. A passive 50 Hz system operating on the magnetic flux produced by live overhead power cables is shown to be capable of indicating the presence and direction of such wires at ranges in excess of 500 m. Finally, a CO2 pulsed laser radar is discussed together with a processing algorithm to highlight wire presence. It is shown that identification of a 1/8 in. diameter wire at 200 m range and in a visibility of 200 m is possible using only 4 W of laser power. (Author)

A82-16561 **Trends in maintainability and reliability of avionics systems with particular reference to DCAD Technical Publication 1/77.** A. F. Loy (Ministry of Defence /Procurement Executive/, London, England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 433-439. 6 refs.

The procurement situation with respect to reliability and maintainability (R&M), prior to the DCAD Technical Publication 1/77 (1978), is reviewed first. The general contents of the document and the translation of the document's principles into a form suitable for contracts are then discussed. Application of the publication is outlined, and an indication is given of the direction R&M activity should proceed in order to meet the challenges of future systems. Particular attention is given to the reliability parameter, which has presented a more serious problem during the design, development, and production phases. J.F.

A82-16562 **Head-up displays - The integrity of flight information.** L. L. Dopping-Hepenstal (British Aerospace Public, Ltd., Co., Aircraft Group, Kingston-upon-Thames, Surrey, England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 440-442.

Single-pilot military aircraft are usually designed with head-up displays (HUD), which enhance the safe operational flight envelope and the flexibility of weapons delivery. The shortcomings of the self-monitoring circuits in these HUD systems require the pilot to continually cross-check the display with the conventional head-down instruments. A fully integrated approach to the system design is required which would tackle the subject as a whole, and not as a set of individual equipment-related problems. Sensor redundancy is the most straightforward way to improve system integrity, but is likely to have the highest cost, weight, and installation penalty. A general solution will probably not be found, since each aircraft system will have to be studied with respect to its equipment fit, as well as its operational task and environment. J.F.

A82-16563 **VOR waveform synthesis and calibration.** R. W. White, R. N. Clarke, and R. W. Yell (National Physical Laboratory, Teddington, Middx., England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 443-450. 9 refs.

The development and assessment of two standard VHF omni-range radial systems (VOR) waveform synthesizers and a VOR waveform decoder are considered. The synthesizers are designed to regenerate waveforms for calibrating aircraft receivers on the ground. One synthesizer, a computer-controlled system, is excellent for producing imperfect waveforms; the second synthesizer standard is a compact portable unit suitable for field system testing and standards dissemination. The decoder design is based on digital sampling and storage of one cycle of the composite audio waveform; the data is then Fourier transformed and analyzed to determine the FM depth and the differential phase of the two 30 Hz modulating signals, the VOR bearing angle. The standard synthesizer and decoder standards have demonstrated uncertainties not exceeding the 95% confidence level. The sensitivity of the detection method to digitization uncertainties, asynchronism between decoder and generator, anharmonic 9.96 kHz subcarriers, and random amplitude and phase noise is also investigated. J.F.

A82-16564 **Design and performance of airborne radomes - A review.** G. A. E. Crone (ESA, European Space Research and Technology Centre, Noordwijk, Netherlands), A. W. Rudge (ERA Technology, Ltd., Leatherhead, Surrey, England), and G. N. Taylor (Royal Signals and Radar Establishment, Malvern, Worcs., England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing,* vol. 128, pt. F, no. 7, Dec. 1981, p. 451-464. 68 refs.

Radomes for airborne amplification can be classified as either (1) large aircraft radomes of the nose-cone or under-fuselage type, (2) small aircraft radomes flush-mounted to the airframe, or (3) missile radomes. The geometry of the radome often leads to severe degradation of the electrical performance of any enclosed antenna. The requirement for a good aerodynamic shape is shown to influence the electromagnetic design of the radome, and the choice of dielectric materials is limited by the needs for structural strength, low weight, thermal stability, and rain erosion resistance. The radome performance may also be compromised by the scattering of electromagnetic waves from metallic pilot tubes and lightning protection strips outside the radome, as well as dielectric pressure tubes within it. The electromagnetic design of the three types of radomes are reviewed, sources of degradation of the enclosed antenna radiation pattern are examined, and the design requirements of the radomes, with respect to their operational environment, are discussed. J.F.

A82-16692 **A method for predicting the lifetime of gas turbine blades.** H. Policella and J.-P. Culié (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *Fatigue of Engineering Materials and Structures,* vol. 4, no. 2, 1981, p. 157-172. 17 refs.

The article describes a method developed at ONERA for predicting the lifetime of gas turbine blades. This method makes use of non-linear viscoplastic constitutive laws, the problem being solved from a plane cross section assumption and through a time-step linearization. The initiation of the first macroscopic crack is calculated from a stabilized cycle condition. A blade test rig has been developed for checking the method under load and temperature conditions that are as close as possible to operational ones. The results of two series of test on convection cooled IN100 blades prove the method to be acceptable to design engineers. (Author)

A82-16734 Technological innovation for success - Liquid hydrogen propulsion. J. L. Sloop (International Consultants on Energy Systems, Bethesda, MD). In: Between Sputnik and the Shuttle - New perspectives on American astronautics. San Diego, CA, Univelt, Inc., 1981, p. 225-239. 23 refs.

Hydrogen produces the highest exhaust velocity of all chemical fuels, thus producing the highest rocket velocities, but also has a low density, only one-quarter that of water. The development of hydrogen as a rocket fuel was begun in the early 1900s, though experiments were few due to the difficulty of obtaining liquid hydrogen. Para- and orthohydrogen were discovered in 1926, and catalysts to prevent the natural conversion of para to ortho, which tended to boil away liquefied hydrogen, were invented in the 1950s. Rocket testing using liquid hydrogen began in the 1940s, and the demand for liquid hydrogen increased for testing of thermonuclear weapons, although the supply of LH did not grow until the possibility for its use as a fuel for high altitude reconnaissance planes was investigated. Once NASA was created, the progress of an LH fueled stage for the Atlas rocket accelerated LH research, and led to NASA control of the development of the Saturn CV launch vehicle. An alternative use of liquid hydrogen as an automotive fuel is indicated. M.S.K.

A82-16746 Noise control measures in the new Singapore International Airport. R. B. W. Heng (National University of Singapore, Kent Ridge, Singapore). *Applied Acoustics,* vol. 14, Nov.-Dec. 1981, p. 439-453. 9 refs.

Noise control designs for the passenger terminal building of the Singapore International Airport are discussed. Three internal noise level areas were defined: noncritical public areas, general office areas, and conference rooms and the VIP lounge. Overall facade sound insulation comprised 27 mm of laminated glass. Rockwool blankets and perforated metal sheets were used in ceilings to lower reverberation levels in public areas. All contracted components were laboratory tested as a quality control procedure. Sound insulation requirements ranged from 32-45 dB, including doors, and an articulation loss level of 20% was set as a maximum for the distributed speaker public address system. M.S.K.

A82-16800 Grumman Tomcat - In a class of its own. R. M. Braybrook. *Air International,* vol. 22, Jan. 1982, p. 23-30.

Design, performance, and operational features of the F-14A Tomcat fighter are discussed. The validity of the variable geometry wings was established by NASA in wind tunnel tests which defined hinge points far enough away from the fuselage to stabilize the aerodynamic center in its rearward movement during a swept back mode. The Tomcat has a maximum mission weight of 70,426 lb with six Phoenix missiles, a maximum speed over Mach 2, can take off in 1300 ft, and land at 122 kt in 2000 ft. The wings sweep from 20-68 deg, roll is provided by differential tailplane movements, and the plane flies with no angle-of-attack restrictions. The weapons and target detection systems are described, noting the presence of an IR sensor to offset radar deficiencies in a jamming environment. Future versions of the F-14 will feature television for long range visual target identification, an improved Phoenix missile with longer range and better target resolution in a cluttered environment, and an expanded computer radar memory. M.S.K.

A82-16901 # Experience with high performance V/STOL fighter projects at MBB. F. Aulehla and G. K. Kissel (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2614.* 16 p. 9 refs.

Flight control systems and aerodynamic aspects of experimental V/STOL aircraft are discussed. The VJ 101 C featured tilting engines for increased thrust, reheat for takeoff, simple translation, triangular decentralization of the engines for thrust modulation, and moderate ground effects. Two experimental aircraft were built, with and without reheat, capable of Mach 2 and Mach 1.04, respectively. The mechanical flight control system and tests are outlined, both for hover rig and flight configurations. Ground suction, acoustic and thermal loading, sodium silicate coatings to avoid ground corrosion, and recirculation are considered. Results of the follow-on project to the VJ 101 C, the AVS, which was developed by NASA, are reviewed, and it is noted that trends toward thrust-to-weight ratios exceeding one, in concert with low wing loading, favor the development of V/STOL aircraft. M.S.K.

A82-16902 * # A summary of V/STOL inlet analysis methods. D. P. Hwang and J. H. Diedrich (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2628.* 8 p. 21 refs.

Methods to analyze the aerodynamic performance of V/STOL inlets at the NASA Lewis Research Center are discussed with emphasis on recent extensions and applications. Methods include the specification of the Kutta condition for a slotted inlet, the calculation of suction and tangential blowing for boundary layer control, and the analysis of auxiliary inlet geometries at angles of attack. An optimum diffuser velocity distribution is also developed, which can result in the shortest no-boundary layer control inlet and the lowest loss for the required amount of diffusion. D.L.G.

A82-16903 # Development and validation of the V/STOL aerodynamics and stability and control manual. C. Henderson and M. M. Walters (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2611.* 8 p. 13 refs.

A V/STOL Aerodynamics and Stability and Control Manual was developed to provide prediction methods which are applicable to a wide range of V/STOL configurations in hover and transition flight, in and out of ground effect. Propulsion-induced effects have been combined with unpowered aerodynamics in a buildup of total forces and moments for the jet-lift concept, so that total aerodynamics can be used to predict aircraft stability, control, and flying qualities characteristics. Results of longitudinal aerodynamic predictions have been compared with test data, and indicate that the methods are fast, inexpensive, and within the desired accuracy for the objective preliminary design stage. D.L.G.

A82-16904 # A summary of jet-impingement studies at McDonnell Douglas Research Laboratories. W. W. Bower, K. R. Saripalli, and R. K. Agarwal (McDonnell Douglas Research Laboratories, St. Louis, MO). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2613.* 13 p. 12 refs. Contracts No. N00014-76-C-0494; No. N00014-79-C-0836.

It has been the primary objective of the considered studies to determine and describe, through calculation, measurement, and visualization of the flowfields, the basic character of isolated and interacting impinging jets. The secondary objective has been to provide computed and experimental flow properties which can be used in the development and verification of empirically based prediction methodologies for complex aircraft configurations. The studies have resulted in the solution of the Reynolds-averaged Navier-Stokes and Jones-Launder turbulence model equations for two- and three-dimensional configurations and in the acquisition of an extensive data base and flow-visualization photographs for these configurations. C.R.

A82-16905 # An investigation of the use of a propulsive wing/canard concept for improved maneuvering. V. R. Stewart (Rockwell International Corp., Columbus, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2622.* 9 p.

The propulsive wing concept is an extension of the flap boundary layer control utilized on several aircraft configurations. Several studies have been made regarding the benefits of the propulsive wing in STOL operation. However, the propulsive wing/canard provides performance benefits also in areas other than STOL. It is expected to improve the maneuvering capability by providing reduced drag at high lift coefficients without appreciable singular thrust control and the optimal junction of different subarcs are analyzed. It is noted that with the normalizing of the control variables, that is, the thrust-to-weight ratio, the bank angle, and the load factor, the results can be applied to any supersonic aircraft. C.R.

A82-17907 # **An application of invariance principle to pilot model for NT-33 aircraft with variable coefficients and delays.** A. S. C. Sinha (Purdue University, Indianapolis, IN). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0367*. 7 p. 13 refs. Contract No. F49620-79-C-0038.

A method is presented for analyzing pilot-induced oscillations (PIO) for the NT-33 closed-loop pilot model when retardations and coefficients are not constant. The variation of retardations and coefficients results from the effect of wind shear and the neuromuscular dynamics of the pilot reported in available data. Nonlinearities in the model are also considered. The method is based on the use of a new description of such systems in terms of convolution equations. Spectral factorization is applied to the entire functions of exponential order. The result is a criterion for the PIO-system with variable coefficients and variable delays. The criterion assumes continuity and boundedness of the coefficients and delays. A Lyapunov functional is constructed which gives a criterion on the roots of a certain 'quasi-polynomial,' i.e., a polynomial in a variable and the exponential of that variable. The largest domain of attraction is obtained from the Invariance Principle. (Author)

A82-17908 # **Flutter mode suppression using hyperstable feedback.** G. L. Slater (Cincinnati, University, Cincinnati, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0368*. 11 p. 9 refs.

The stability properties of hyperstable systems are explained and a synthesis procedure for multivariable feedback control laws is formulated and applied to the flutter control problem. The feedback controller is determined by: (a) constructing a state variable feedback law using a simplified model of the actual system dynamics, and (b) constructing a Luenberger observer for this system where the observer gain matrix is determined based on the hyperstable criterion. The procedure is applied to two design cases, one which is open-loop stable and the second which is open loop unstable. Results indicate that the hyperstability conditions can be utilized conveniently to develop a stable, robust elastic mode suppression system. (Author)

A82-17909 * # **The residue-measure criterion for model reduction in the analysis of the NASA Space Shuttle's digital flight control system.** D. P. Gluch (Honeywell, Inc., Clearwater, FL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0369*. 9 p. 8 refs. Research supported by the Honeywell, Inc., Rockwell International Corp., and NASA.

A residue-measure criterion model reduction technique is applied to the vehicle dynamics model used in the design and analysis of the NASA Space Shuttle's digital flight control system. As implemented in this study the residue-measure technique involved an a priori residue calculation with control system biasing. The predictions of the reduced model are compared to vehicle level dynamic stability test data. These comparisons show an excellent correlation of the dominant spectral and response features between the model and test data. In addition, the application of the reduction technique to various Shuttle mission flight phases is demonstrated. (Author)

A82-17910 # **Target acceleration modeling for tactical missile guidance.** P. L. Vergez (USAF, Armament Laboratory, Eglin AFB, FL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0370*. 13 p. 8 refs.

This paper addresses the critical problem of estimating the missile-to-target position, velocity, and acceleration (required by the linear optimal guidance law) when only passive (angle only) seeker information is available on-board a highly maneuverable bank-to-turn missile concept. More specifically, the problem is how to model the target acceleration to achieve improved missile performance. Four target acceleration models coupled with an extended Kalman filter are presented and evaluated on a six degree-of-freedom missile simulation to determine their estimation effectiveness and their influence on missile guidance. (Author)

A82-17911 # **Performance considerations in the design of subsonic cruise missiles.** R. L. Hanson and M. H. Kiehle (Boeing Aerospace Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0371*. 11 p.

The recent introduction of advanced radar-controlled defenses to the territory of potential enemies has altered the requirements of both strategic and tactical cruise missiles, which have previously included only low specific fuel consumption and low vehicle weight. After a historical survey of cruise missile design practices, and an assessment of the capabilities of the current Harpoon, ALCM and Tomahawk systems, consideration is given to the impact of cruise missile radar cross section (RCS) and infrared signature in the emerging enemy defenses scenario. It is shown that the avoidance of fuselage, wing and control surface configurations with sharp points and tips that increase RCS leads to deltoid and saucer-like designs whose aerodynamic characteristics are not strictly in keeping with the efficient, high-speed cruise requirement. The construction of airframes from radar-absorbing materials is recommended. O.C.

A82-17912 # **An aerodynamic and signature shaping technique for developing advanced supersonic missile concepts.** R. J. Krieger (McDonnell Douglas Astronautics Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0373*. 10 p. 13 refs.

A technique has been developed for optimizing the aerodynamic and signature characteristics of advanced, non-circular supersonic missile concepts. Sensitivity equations which guide configuration shaping are derived for the aerodynamic coefficients of axial force, normal force, pitching moment and lift-to-drag ratio; and for the signature characteristics of radar cross section and shadowing of surfaces. The implementation of the procedure in the computer aided design process is presented. Characteristics of the resulting shapes are verified by comparison with wind tunnel and high range resolution radar data. Applications are given for forebodies, boattail/base/nozzle integration and a complete configuration. (Author)

A82-17919 # **Viscous flow - Nemesis of the theoretician in pursuit of higher order accuracy.** L. E. Ericsson (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0389*. 13 p. 60 refs.

A review of viscous flow effects shows that the effects of large regions of separated flow on the vehicle dynamics cannot be mistaken for higher order inviscid flow effects because of their magnitude and nature. The effects of a thick boundary layer or of a small local separated flow region is less drastic; they may often be mistaken for a higher order inviscid flow effect. It is noted that because viscous effects are often large, even for attached hypersonic flow, great care is needed when comparing inviscid theory with experiment. An example is furnished by the effect of nose bluntness on slender cone unsteady aerodynamics. It is thought that for the foreseeable future the only practical means of obtaining the full scale unsteady viscous flow characteristics will be by the interactive use of experimental and theoretical results to obtain 'dynamic solution through analytic extrapolation'. C.R.

A82-17920 # **Evaluation of supersonic missile aerodynamic prediction techniques.** J. E. Williams (McDonnell Douglas Astronautics Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0390*. 12 p. 30 refs.

Qualitative and quantitative analyses performed by comparing predictions with test data, and evaluating method accuracy according to a novel criterion, are presented for the case of ten methods used in the prediction of missile aerodynamic characteristics at supersonic speeds. It is found that: (1) while adequate predictions can be obtained for missile configurations in the conventional, airbreathing, and cruise missile classes, improvements are needed to address the lifting-body missile class; (2) of the two method categories considered, component-buildup and paneling techniques, that composed of methods employing configuration component-buildup may be enhanced by existing techniques that would result in greater accuracy or capability; and (3) the Datcom, NSWC, Missile 2, Aerodyn, and S/HABP component-buildup methods are found useful in the complete longitudinal aerodynamic analysis of missiles. O.C.

A82-17928 # **The feasibility of turnback from a low altitude engine failure during the takeoff climb-out phase.** B. W. Jett (U.S. Naval Academy, Annapolis, MD). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0406.* 12 p.

A new procedure is proposed for responding to engine failures in single-engine aircraft that occur at a low altitude during the takeoff/climb-out phase of flight. The procedure involves a 180-deg turn back to the vicinity of the airfield. Here, the pilot must find the optimum bank angle and airspeed for the turn; this can be done by applying aerodynamic principles to a steady state power-off gliding turn. The feasibility of this maneuver is investigated here by testing a wide range of pilots under controlled conditions using a variable stability flight simulator. It is noted that the theoretical optimum bank angle and airspeed can also be verified experimentally. Data are acquired in real time during the test flights using an automated, computer-controlled data acquisition system. The combination of theoretical analysis and experimental data yields an optimum procedure for a turn back to the airfield and demonstrates that the maneuver is within the capability of a typical private pilot. C.R.

A82-17930 # **Experimental structural testing on a composite aircraft canard and its applications.** K. S. Caldwell, Jr. (Texas, University, Arlington, TX). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0409.* 9 p.

This paper presents the results and discussion of several structural tests performed on the canard of The University of Texas at Arlington's experimental aircraft, the Varieze. From various tests the influence and the c-cubed coefficients of the bending and twisting matrixes were obtained. From these results one can accurately determine the bending and twisting of the canard that will result for any force and moment applied. Applications of these coefficients to graphics computers and swept-wing design are discussed. Two canards that were failed to destruction due to an excess bending load are also discussed, documenting radical structural differences in the final homebuilt products when both canards employed the same amount of material and were constructed from the same set of plans. (Author)

A82-17931 # **High temperature in situ experimentation in HVEM instrumentation and application to materials science.** R. Valle, B. Genty, A. Marraud (CNRS and ONERA, Laboratoire de Microscopie THT, Châtillon-sous-Bagneux, Hauts-de-Seine, France), and J. Cadoz (CNRS, Laboratoire de Physique des Matériaux, Meudon, Hauts-de-Seine, France). *ONERA, TP* no. 1981-77, 1981. 5 p.

The design and construction of high temperature specimen holders for experimentation on superalloys and ceramics is discussed. A double tilting holder, a double tilting straining holder, and the composition and surface finishes are described. The holders can withstand up to 1500 K, using optically smooth tungsten jaws held in a golden molybdenum tip. Gold-coated shield, either tantalum or silica, have been chosen because of low emissivity when used as thermal shields, in addition to the mechanical property of remaining flat at elevated temperatures. A heating system has been devised comprising tungsten heating elements radiating in long holes machined directly in the jaws. Mention is made of experiments already performed on NiO single crystals at 1400 K. M.S.K.

A82-17932 # **Highlights of a design concept for a close ground support fighter.** D. J. Dacquino (Lockheed-California Co., Burbank, CA) and R. J. Raffaele (Arizona State University, Tucson, AZ). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0411.* 12 p. 9 refs.

The design concept makes use of recent technological developments in order to improve payload and endurance capabilities. The preliminary design is based on a study of gross weight, airfoil and wing design, weight and balance, and performance analysis. A computer simulation of such standard performance requirements as takeoff and initial climb, climb performance, and range and endurance indicates a successful integration of these techniques. C.R.

A82-17934 # **Pressure distribution on an ogee wing in supersonic flow.** M. E. Vaughn, Jr. (Auburn University, Auburn, AL). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0414.* 11 p. 22 refs. Research sponsored by Auburn University; Grant No. DAAG29-78-G-0036.

An approximate method is developed which extends pressure distribution theories for wings of constant sweep to wings with curvilinear leading edges. Two cases are considered. In the first case of a predominantly subsonic leading edge, and analogy is made to a wing in conical flow. In the second case of a supersonic/subsonic leading edge, physical reasoning is used to approximate the flow regions on the wing with line-source solutions. An application is made to a wing of ogee planform and comparisons with experimental data prove very favorable. Each case typically required under 7 seconds of computer time (IBM 3031). (Author)

A82-17936 * # **The effect of non-linear propagation in jet noise.** J. A. Gallagher. *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0416.* 9 p. 10 refs. Grant No. NAG1-10.

An experimental investigation of the nonlinear propagation effects which occur in the noise radiated from low and moderate Reynolds number supersonic jets has been performed. An array of three condenser microphones was used to measure the waveforms propagated by axisymmetric, cold model jets of Mach numbers 2.1 and 2.5. Relatively low Reynolds numbers were obtained by exhausting the jets into a low pressure anechoic test chamber. The results show that phenomena normally associated with nonlinear acoustic propagation, such as wave steepening, harmonic generation and wave merging, are measurable in the high speed model jets. (Author)

A82-17951 **Flight mechanics - Modern aircraft design and control concepts (Flugmechanik - Moderne Flugzeugentwurfs- und Steuerungskonzepte).** X. Hafer (Darmstadt, Technische Hochschule, Darmstadt, West Germany) and G. Sachs (München, Hochschule der Bundeswehr, Munich, West Germany). Berlin, Springer-Verlag, 1980. 282 p. 199 refs. In German. $34.26.

The state-of-the-art of aircraft design and control concepts are presented. Design features of aircraft of natural and artificial stability are discussed, with emphasis on the tail unit, trim drag and maximum lift, as well as the dynamics of unregulated, unstable aircraft. Various aspects of direct force control are then outlined: direct lift control, direct side force control, and direct drag control. Finally, other possible uses for active control technology are discussed, including artificial lateral stability, automatic maneuvering flaps, variable cambers, maneuver load control for large aircraft, gust load alleviation, and active flutter suppression. J.P.

A82-18021 # **Responses of oscillating wings in weak shear flow.** A. Sasaki (Mitsubishi Electric Co., Ltd., Amagasaki, Japan) and M. Kobayakawa (Kyoto University, Kyoto, Japan). *Japan Society for Aeronautical and Space Sciences, Transactions,* vol. 24, Nov. 1981, p. 139-151. 10 refs.

In this paper, a theory on wings which are oscillating in a weak shear flow is presented. The potential lifting surface theory is extended to the shear flow case by successive approximations. An integral equation is derived by the singularity method to the first order approximation, and it is solved numerically by the mode function method. For examples of calculations, oscillating wings with heaving and pitching modes in a shear flow are treated. Generalized forces which can easily be related with unsteady lift forces and moments are obtained. Results show that the shear flow decreases all forces in amplitudes, and moreover, a slight phase-lag and a phase-lead appear in heaving and pitching oscillations, respectively. (Author)

A82-18022 # **A contribution to the hodograph method for shock-free transonic airfoil sections.** T. Shigemi (National Aerospace Laboratory, Tokyo, Japan). *Japan Society for Aeronautical and Space Sciences, Transactions,* vol. 24, Nov. 1981, p. 152-168. 13 refs.

(AD-A105511; SWRI-14-5863; USAAVRADCOM-TR-81-D-26) Avail: NTIS HC A13/MF A01 CSCL 13/12

Hovering helicopters accumulate excessive charge as a result of triboelectrification, surrounding space charge, and external electric fields that result in high electrostatic potentials on the aircraft. Electrostatic energy stored on the helicopter can cause electrical discharges to occur from the cargo hook when contact is made with the ground or ground personnel. Laboratory model studies were conducted under electrostatic conditions simulating hovering aircraft to show that on-board instrumentation capable of measuring electric field intensity and charge density can provide the basis for indirectly inferring the correct potential relative to ground of a spherical model test body. Potential of the model was inferred for three cases involving electrostatic instrumentation located (1) on the ground below the model, (2) installed at the south pole of the model, and (3) mounted at the end of the simulated cargo hook. Analysis of laboratory test data resulted in empirical derivations of unique electric field curves for each of the three cases studied. The first two cases were also studied analytically by solving Poisson's equation for a sphere between two parallel plates, and the mathematical expressions substantiated the laboratory results. Methodology for developing a full-scale helicopter electrostatic discharger system to eliminate hazardous potentials on helicopter aircraft is described.
Author (GRA)

N82-14090*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

GAS TURBINE CERAMIC-COATED-VANE CONCEPT WITH CONVECTION-COOLED POROUS METAL CORE

Albert F. Kascak (AVRADCOM Research and Technology Labs., Cleveland), Curt H. Liebert, Robert F. Handschuh, and Lawrence P. Ludwig Dec. 1981 14 p refs Sponsored in part by U.S. Army Aviation Research and Development Command, St. Louis
(NASA-TP-1942; AVRADCOM-TR-81-C-7; E-732) Avail: NTIS HC A02/MF A01 CSCL 21E

Analysis and flow experiments on a ceramic-coated-porous-metal vane concept indicated the feasibility, from a heat transfer standpoint, of operating in a high-temperature (2500 F) gas turbine cascade facility. The heat transfer and pressure drop calculations provided a basis for selecting the ceramic layer thickness (to 0.08 in.), which was found to be the dominant factor in the overall heat transfer coefficient. Also an approximate analysis of the heat transfer in the vane trailing edge revealed that with trailing-edge ejection the ceramic thickness could be reduced to (0.01 in.) in this portion of the vane. B.W.

N82-14091*# National Aeronautics and Space Administration, Washington, D. C.

WIND TUNNEL TESTS OF ENGINE-EQUIPPED MODELS: COMPARISON OF TWO JET WASH SIMULATION METHODS

J. P. Becle and R. Perin Dec. 1981 43 p ref Transl. into ENGLISH of 'Essais en Soufflerie de Maquetter Motorisees. Comparison de Deux Methodes de Simulation des Jets des Reacteurs'' rept. T.P. 1981-42, France, 1981 p 1-18 Presented at the AGARD/FDP Symp. Aerodynamics of Power Plant Installation, Toulouse, 11-14 May 1981 Original language document was announced as A81-39245 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by ONERA, Toulouse
(Contract NASw-3542)
(NASA-TM-76764; TP-1981-42) Avail: NTIS HC A03/MF A01 CSCL 21E

The optimization of performance factors in state of the art civil aircraft was studied by using powered models in wind tunnels. In cooperation with ONERA, two methods of cold simulation of jet engine washes were developed. The first, called 'blown jet', benefitted from the previously perfected test set-ups made for studies of the CONCORDE. The second, which utilized small air-turbines, were recently put into operation for the AIRBUS family of aircraft. The facilities, the measurement equipment and the methods of exploiting the results are described. The relative value of each of the methods of motorization is analyzed: complexity of equipment, duration, precision of measurements and comparison of results are also discussed. A.R.H.

N82-14094*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THE USE OF OPTIMIZATION TECHNIQUES TO DESIGN CONTROLLED DIFFUSION COMPRESSOR BLADING

Nelson L. Sanger 1982 18 p refs Proposed for presentation at the 27th Ann. Intern. Gas Turbine Conf., London, Apr. 18-22, 1982; sponsored by ASME
(NASA-TM-82763; E-1084) Avail: NTIS HC A02/MF A01 CSCL 21E

A method for automating compressor blade design using numerical optimization, and applied to the design of a controlled diffusion stator blade row is presented. A general purpose optimization procedure is employed, based on conjugate directions for locally unconstrained problems and on feasible directions for locally constrained problems. Coupled to the optimizer is an analysis package consisting of three analysis programs which calculate blade geometry, inviscid flow, and blade surface boundary layers. The optimizing concepts and selection of design objective and constraints are described. The procedure for automating the design of a two dimensional blade section is discussed, and design results are presented. E.A.K.

N82-14095*# AiResearch Mfg. Co., Phoenix, Ariz.

POLLUTION REDUCTION TECHNOLOGY PROGRAM SMALL JET AIRCRAFT ENGINES, PHASE 3 Final Report

T. W. Bruce, F. G. Davis, T. E. Kuhn, and H. C. Mongia Dec. 1981 180 p refs
(Contract NAS3-20819)
(NASA-CR-165386; AiResearch-21-3615) Avail: NTIS HC A09/MF A01 CSCL 21E

A series of Model TFE731-2 engine tests were conducted with the Concept 2 variable geometry airblast fuel injector combustion system installed. The engine was tested to: (1) establish the emission levels over the selected points which comprise the Environmental Protection Agency Landing-Takeoff Cycle; (2) determine engine performance with the combustion system; and (3) evaulate the engine acceleration/deceleration characteristics. The hydrocarbon (HC), carbon monoxide (CO), and smoke goals were met. Oxides of nitrogen (NOx) were above the goal for the same configuration that met the other pollutant goals. The engine and combustor performance, as well as acceleration/deceleration characteristics, were acceptable. The Concept 3 staged combustor system was refined from earlier phase development and subjected to further rig refinement testing. The concept met all of the emissions goals. E.A.K.

N82-14096*# AiResearch Mfg. Co., Phoenix, Ariz.

ERBS FUEL ADDENDUM: POLLUTION REDUCTION TECHNOLOGY PROGRAM SMALL JET AIRCRAFT ENGINES, PHASE 3 Final Report

T. W. Bruce, F. G. Davis, T. E. Kuhn, and H. C. Mongia [1982] 47 p refs
(Contract NAS3-20819)
(NASA-CR-165387; AiResearch-21-3619) Avail: NTIS HC A03/MF A01 CSCL 21E

A Model TFE731-2 engine with a low emission, variable geometry combustion system was tested to compare the effects of operating the engine on Commercial Jet-A aviation turbine fuel and experimental referee broad specification (ERBS) fuels. Low power emission levels were essentially identical while the high power NOx emission indexes were approximately 15% lower with the EBRS fuel. The exhaust smoke number was approximately 50% higher with ERBS at the takeoff thrust setting; however, both values were still below the EPA limit of 40 for the Model TFE731 engine. Primary zone liner wall temperature ran an average of 25 K higher with ERBS fuel than with Jet-A. The possible adoption of broadened proprties fuels for gas turbine applications is suggested. E.A.K.

N82-14097# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.

OPTIMIZATION OF COMPRESSOR VANE AND BLEED SETTINGS Final Report, May 1979 - May 1981

J. E. Garberoglio, J. O. Song, and W. L. Boudreaux Wright-Patterson AFB, Ohio AFWAL Jun. 1981 83 p refs
(Contract F33615-79-C-2018; AF Proj. 2307)
(AD-A108059; PWA-FR-14487; AFWAL-TR-81-2046) Avail: NTIS HC A05/MF A01 CSCL 21/5

This report evaluates optimization methods for their effectiveness in relating multistage axial compressor test data to the decision to vary a selected vane or bleed to reach a predetermined performance goal. Compressor simulations were used in a comparative evaluation and each method was judged on the basis of the number of tests required to achieve an optimum performance goal. The influence of measurement errors and finite vane travel were also prime considerations. Based on this evaluation, the COPES/CONMIN approximate optimization technique was chosen most suitable. Author (GRA)

N82-14098# Naval Postgraduate School, Monterey, Calif.
FOREIGN OBJECT DAMAGE IN NAVAL AIRCRAFT ENGINES M.S. Thesis
Jack B. Mills Jun. 1981 138 p refs
(AD-A105787) Avail: NTIS HC A07/MF A01 CSCL 01/3

An investigation of historical data was conducted in an attempt to assign a specific cause to each foreign object damage incident reported during an eighteen month period. Interviews were conducted with engineers and fleet maintenance personnel in support of the above research. The impact of current FOD reporting procedures, the foreign objects, the ingestion process and the operating environment are discussed. Conclusions and recommendations are included. Author (GRA)

N82-14099# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.
CORROSION INHIBITING ENGINE OILS Final Interim Report, 4 Sep. 1979 - 1 Dec. 1980
G. C. Brown, R. J. Meehan, and P. A. Warner Wright-Patterson AFB, Ohio AFWAL Aug. 1981 73 p refs
(Contract F33615-79-C-5088)
(AD-A106127; PWA-FR-13906; AFWAL-TR-81-4028) Avail: NTIS HC A04/MF A01 CSCL 11/8

The Fluids, Lubricants, and Elastomers Branch of the Materials Laboratory, AFWAL, established the requirements for a MIL-L-7808H operational oil with corrosion inhibition characteristics at least equal to those of MIL-C-8188C. The new oil formulation is to provide corrosion inhibition under long-term storage conditions of the ALCM F107 turbine engine. During the initial fifteen-month effort, several approaches were evaluated as candidate methods for determining the effectiveness of corrosion inhibiting oil additives. A screening procedure was developed after preliminary modifications were made to the Corrosion Rate Evaluation Procedure (CREP). Using the CREP together with compatibility and miscibility screening of oil/inhibitor blends, a total of 67 candidate corrosion inhibitors (CCI) were evaluated. These included CCI obtained from Bray Oil Company, El Monte, California, as part of a subcontract to synthesize candidate corrosion inhibitors. Additional tests were completed on a preliminary physical and chemical property evaluation of the oil/inhibitor blends in regard to MIL-L-7808H and MIL-C-8188C specifications. GRA

N82-14101*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MLS VERTICAL GUIDANCE AND NAVIGATION FOR A STOL AIRPLANE LANDING ON AN ELEVATED STOLPORT
David N. Warner, Jr. Nov. 1981 27 p refs
(NASA-TM-81338) Avail: NTIS HC A03/MF A01 CSCL 01C

In contrast to CTOL landing operations, STOL airplanes landing on short STOLport runways typically begin the flare maneuver before reaching the runway surface. Vertical guidance procedures were developed to allow an autoland flight control system for a STOL airplane to use Microwave Landing System (MLS) signals as altitude and sink rate references for flare initiation, with a transition to radar altimeter after the airplane is over the runway. The implementation has minimum impact on the control system and landing performance. Data are presented which show validation of the concepts in a simulator. Author

N82-14102 Royal Aircraft Establishment, Farnborough (England).
THE DESIGN OF A JET CATCHER
K. G. Winter and L. F. East Feb. 1981 11 p refs
(RAE-TM-AERO-1891; BR78882) Copyright. Avail: Issuing Activity

A device for catching and dissipating the kinetic energy of a jet used in a boundary layer tunnel to eliminate unwanted air currents is described. A dished front face and a large outlet catch the jet, avoiding spillage, and pass it through a screen set normal to the flow in order to reduce kinetic energy. The screen is inclined so as to take advantage of refraction. An additional muslin screen reduces noise. Final outlet velocity is 1/8 of the jet velocity, although there is slight spillage. Author (ESA)

N82-14103 Royal Aircraft Establishment, Farnborough (England).
AN AFTERBODY DRAG BALANCE
A. G. Kurn Mar. 1981 12 p ref
(RAE-TM-AERO-1887; BR78348) Copyright. Avail: Issuing Activity

A strain gage drag balance was made to fit into the jet blowing rig in a transonic wind tunnel. Differences in the drag of various axisymmetric boattailed afterbodies surrounding an engine exhaust nozzle were determined. Three sets of four flexures are spaced equally along the x axis, with strain gages on the middle set. The gages on the center flexures form bridges, compensated for thermal induced drift. Calibration shows that signals are linear with drag force. Output signals can be monitored from two separate strain gage circuits. The device can withstand components of force and moment that might be applied during model assembly. Drag values up to 20N can be measured. Author (ESA)

N82-14104# Grumman Aerospace Corp., Bethpage, N.Y.
STUDY OF FIBER OPTICS TO ENHANCE AN ENVIRONMENTAL LIGHTING LABORATORY Final Report, Nov. 1979 - Mar. 1981
J. Connelly Wright-Patterson AFB, Ohio AFWAL Aug. 1981 154 p Prepared in cooperation with Galileo Electro-Optics Corp., Sturbridge, Mass.
(Contract F33615-79-C-3629; AF Proj. 2403)
(AD-A106117; AFWAL-TR-81-3098) Avail: NTIS HC A08/MF A01 CSCL 13/1

This report documents the results of an investigation to determine how fiber optic materials can be utilized to substantially increase the simulation capabilities of an Environmental Lighting Laboratory. This Laboratory must provide the capability to dynamically simulate the ambient environmental illumination conditions encountered in day, night and high threat/high risk aircraft missions. Three cockpit lighting simulator concepts were studied. Two of these concepts utilized a spherical lighting enclosure with a visual scene being projected at the inner surface via a remote projection input surface; fiber optics carry the image from input surface to output surface. In one concept, the pilot views a back-projected image on a translucent spherical screen via a spherical output surface with imbedded fiber optics. In the other concept, the pilot views the spherical fiber optic output surface directly. Both concepts were considered possible to implement, each concept having appropriate cost vs. performance tradeoffs. No useful solution was found using the third concept, a fiber optic input to mirrored ellipsoidal enclosure. It was found that the spherical enclosure concept with an internal translucent projection screen offers the best combination of illumination level and resolution; however, the cost of implementing this concept is substantial. GRA

N82-14312# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Fuels Branch.
DETERMINATION OF SELECTED DISTILLATE BLENDING SOLVENTS IN SIMPLE AND COMPLEX AIRCRAFT FUEL MATRICES VIA GLASS CAPILLARY GAS CHROMATOGRAPHY Final Report, Jan. - Dec. 1979
Paul C. Hayes, Jr. Jun. 1981 44 p refs
(AF Proj. 3048)
(AD-A105586; AFWAL-TR-80-2082) Avail: NTIS HC A03/MF A01 CSCL 07/4

A study was initiated to accurately determine the volume percent of various hydrocarbon distillate solvents present in blends with aircraft jet fuels JP-4 and JP-8. These modified fuels were an integral part of a combustion program to elucidate the effect altered fuel properties had on selected combustion parameters. A method of analysis was desired to check the accuracy of both in-house and contractual blending work. The effort was further expanded to even determine the amount of JP-4 present in the event of gross cross-contamination. Author (GRA)

N82-14313# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Fuels Branch.
DETERMINATION OF PYRIDINE IN MODIFIED JP-4 VIA HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) Final Report, Jan. - Jul. 1979
Paul C. Hayes, Jr. Apr. 1981 24 p refs
(AF Proj. 3048)
(AD-A105589; AFWAL-TR-80-2081) Avail: NTIS HC A02/MF A01 CSCL 07/4

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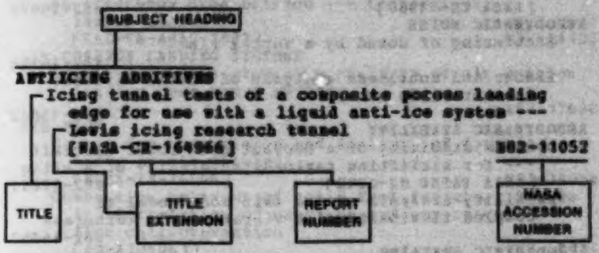
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affecting the low lift drag. An increase in the buffet free load factor can also be expected with the blown wing and canard. Attention is given to a program to investigate the wing/canard at maneuvering conditions, and tests at ranges of blowing coefficients equivalent to STOL operation. G.R.

A82-16906 # Advanced technology airfoil development for the XV-15 tilt-rotor vehicle. J. C. Narramore (Bell Helicopter Textron, Fort Worth, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2623.* 10 p. 15 refs.

Advances in the state-of-the-art of aerodynamics, dynamics, and structures suggest that the flight envelope of the tilt-rotor VTOL vehicle XV-15 can be expanded by an improved rotor blade design. A description is presented of an intensive airfoil development study which has been conducted in connection with the conceived possibilities. State-of-the-art design techniques were used to produce the new sections, and a wind tunnel 'fly-off' between the best airfoils was held. Advanced technology airfoils demonstrated significant improvements in aerodynamic characteristics compared to existing XV-15 blade airfoils. G.R.

A82-16907 * # Ground test of a large scale 'D' vented thrust deflecting nozzle. E. W. Rosenberg (McDonnell Aircraft Co., St. Louis, MO) and R. S. Christiansen (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2630.* 10 p.

Future V/STOL aircraft will require efficient techniques for changing the thrust vector from the vertical direction for VTOL operation to the horizontal direction for conventional flight. Most V/STOL concepts utilize thrust vectoring nozzles to provide this variation in the thrust vector direction. An experimental test program was initiated to demonstrate the capabilities of a large scale 'D' vented thrust deflecting system coupled with a high bypass ratio turbofan engine. Data were obtained for a 'D' vented nozzle mounted behind a YTF-34-F5 turbofan engine. Preliminary data are presented for a variety of test conditions. Attention is given to aspects of 'D' vented nozzle design, the test apparatus, engine-nozzle compatibility, exit area variation, longitudinal vectoring performance, nozzle temperature distribution, and large scale - small scale comparisons. G.R.

A82-16908 # NASA V/STOL Propulsion Control Analysis - Phase I and II program status. R. J. Miller, S. P. Roth, and W. B. Kerr (United Technologies Corp., Government Products Div., West Palm Beach, FL). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2632.* 11 p.

NASA-Lewis Research Center initiated the V/STOL Propulsion Control Analysis Program in 1979 in order to take advantage of advanced electronic control technology for the next generation of V/STOL aircraft. The rationale, methods, and criteria developed during Phase I and Phase II of the program are discussed first. The development of an integrated flight and propulsion control system is then described. Most V/STOL aircraft under consideration depend on reaction thrusters or separate lift engines for attitude control and on engine thrust variations for height control. S/CTOL aircraft vector-thrust for pitch control during low speed operation. The baseline propulsion control system provides a thrust level response of 10 rad/sec and a vectoring response of 22 rad/sec. The requirements of the control components include: (1) redundant electronic control computers with minimum software and 100% Fault Coverage; (2) prime reliable electromechanical actuator interfaces; (3) miniature, digitally compatible sensors with easily detected failure modes; and (4) dual element, fail operational fuel pumps. J.F.

A82-16909 * # V/STOL propulsion control technology. H. Brown (General Electric Co., Cincinnati, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2634.* 10 p. Contract No. NAS3-22057.

Results of a NASA sponsored study of V/STOL Propulsion Control Analysis are presented. The study involved propulsion control requirements, design concepts and procedures, and control designs for supersonic V/STOL. A variable cycle engine with a remote augmented lift system was used as a basis for establishing typical operating requirements and control concepts, and a nonlinear engine model was developed for control development as a precursor to a real-time simulation capability. A simplified aircraft model was also used to investigate transition requirements, and a long-range technology plan was developed to define subsequent program requirements for achieving a real-time piloted simulation capability. D.L.G.

A82-16910 * # Piloted simulation of hover and transition of a vertical attitude takeoff and landing aircraft. G. C. Hill (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2636.* 8 p. 9 refs.

Piloted simulation studies of candidate control systems for VATOL aircraft were conducted on a six degree of freedom simulator. Hover and transitions from wing-born to hovering flight were performed, with and without turbulence, on a representative high performance fighter configuration. Deflection of the rear engine nozzle provided pitch and yaw control moments in concert with reaction controls for roll. Unique motion cues in hover result from the vertical displacement of the cockpit and the thrust vectoring nozzles. Abundant control power available with moderate engine nozzle deflection combined with rate feedback for stability augmentation provided very satisfactory control. (Author)

A82-16911 * # Thrust reversing effects on twin-engine aircraft having nonaxisymmetric nozzles. F. J. Capone, R. J. Re, and E. A. Bare (NASA, Langley Research Center, Transonic Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2639.* 15 p. 21 refs.

The effects of thrust reversing on stability, control and vertical tail loads of advanced fighter aircraft are reviewed. Several static test stand and wind tunnel investigations of nonaxisymmetric nozzles with integral thrust reversers are presented, and it is found that base drag on the aft face of reverser panels of blockers provides a significant contribution to in-flight thrust reverser performance. The location of tail surfaces relative to the thrust reverser has significant impact on control surface effectiveness, and depending on thrust reverser location, large vertical tail side force can result from the use of in-flight thrust reversers. It is concluded that highly effective nonaxisymmetric nozzle reversers can be designed to achieve a 50% static reverse thrust. D.L.G.

A82-16912 # Greenlandair VTOL transportation study. R. R. Reber (Bell Helicopter Textron, Fort Worth, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2642.* 6 p.

An operational and economic analysis was conducted on Greenlandair, a large helicopter commuter operation. Results indicate that the airline could realize a significant increase in available seat miles with a decrease in total cost by replacing the fleet of helicopters and fixed-wing aircraft with Tiltrotors. The Tiltrotor can fly 2.5 times faster than the helicopters, and 25% faster than the presently used turboprop aicraft. Fuel consumption could be reduced by one half, and with additional savings on maintenance, crew costs, and ground support costs, plus expanded flight schedules, the airline could achieve a net yearly savings of over 2 million dollars. D.L.G.

A82-16913 # V/STOL status from the engine technology viewpoint. G. M. Lewis and W. J. Lewis (Rolls-Royce, Ltd., Bristol, England). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2648.* 10 p.

Directions for designs and powerplant configurations for V/STOL aircraft are explored. The Harrier is the only V/STOL aircraft in service, having performed for over 12 yr. Rolls-Royce has studied engines with powered lift separation from forward propulsion, and engines with composite lift/propulsion modes, resulting in concentration on vectored thrust using rotating or deflected nozzles. The necessity for higher combat performance creates a need for higher specific thrust for supersonic flight (Mach 2), which is achievable with plenum chamber burning. The core flows are exhausted through separate nozzle systems for independent control. Intake in a V/STOL follows a short path and results in nonuniform flow, and testing is described to account for the effects of nonuniform static pressures and temperatures. M.S.K.

A82-16914 *# **Helical helicopter approaches with microwave landing system guidance.** L. A. McGee, J. D. Foster, and D. C. Dugan (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2654.* 13 p. 8 refs.

It is desirable that the landing approach of helicopters and V/STOL aircraft into a congested airport equipped with a microwave landing system (MLS) can take place essentially independent of CTOL traffic. The helical approach has been proposed as one way to provide aircraft separation while requiring minimum airspace. A helical descent makes it possible for the helicopter to lose altitude in a confined airspace without descending along an excessively steep glide slope. This avoids helicopter handling problems which occur at slow airspeeds. Preliminary flight-test data are presented regarding the operational feasibility of the helical approach under IFR conditions where the primary guidance information is from an MLS. G.R.

A82-16915 # **Maintenance problems associated with the operation of the F402 /Pegasus/ engine in the AV-8A /Harrier/ aircraft.** C. W. Stanley and W. E. Hood (U.S. Navy, Cherry Point, NC). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2656.* 8 p.

The U.S. Marine Corp (USMC) has been operating the only V/STOL attack aircraft in the western world since 1971. Some of the maintenance problems experienced are related to the unique V/STOL design criteria of the Pegasus engine. However, the major part of the required maintenance effort is found to involve the more conventional engine problems. A description of the aircraft engine is provided and the problems resulting from V/STOL design demands are examined. Attention is given to the fuel system control, the engine air bleed, foreign object damage to the hp compressor, and the engine exhaust system. G.R.

A82-16916 # **A low cost maritime control aircraft-ship-weapons system.** H. Fluk (U.S. Naval Air Engineering Center, Lakehurst, NJ). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2660.* 10 p. 7 refs.

It is pointed out that the long-range antiship standoff missile is emerging as the foremost threat on the seas. Delivered by high speed bombers, surface ships, and submarines, a missile attack can be mounted against selected targets from any point on the compass. An investigation is conducted regarding the configuration of a system which could most efficiently identify and destroy standoff threats before they launch their weapons. It is found that by using ships for carrying and launching missiles, and employing aircraft with a powerful radar only for search and missile directing operations, aircraft cost and weight can be greatly reduced. The employment of V/STOL aircraft in preference to other types of aircraft makes it possible to use ships of smaller size for carrying the aircraft. However, in order to obtain an all-weather operational capability for the system, ships are selected which are still big enough to display the required stability in heavy seas. G.R.

A82-16917 # **Type 'A' V/STOL - One aircraft for all support missions.** W. H. Adelt (McDonnell Aircraft Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2661.* 14 p. 5 refs.

An investigation is conducted regarding the feasibility of developing a single support aircraft type for the Navy, taking into account the current naval inventory of utility aircraft types. Support mission characteristics are examined, giving attention to antisubmarine warfare, airborne early warning, marine assault, carrier on board delivery/vertical on board delivery, the aerial tanker mission, long-range rescue, surface attack, and aspects of combat, search, and rescue. With the aid of a sample design for a V/STOL aircraft with a medium disc loading lift system it is demonstrated that it is now possible to design an aircraft which, with minor modifications, can meet the wide variety of support missions. G.R.

A82-16972 # **Airbus - Perspectives for the future (Airbus - Perspectivas para el futuro).** K. Schleicher Tafel (Construcciones Aeronáuticas, S.A., Madrid, Spain). *IAA/Ingeniería Aeronáutica y Astronáutica*, vol. 33, Nov. 1981, p. 5-16. In Spanish.

The derivation of future commercial aircraft in the 150-300 seat range from the A-300 and A-310 design, according to a staged program of development and technology transfer, is described. After brief consideration of the distribution of program responsibilities among the members of the Airbus consortium, and the derivation of the A-310 from the A-300, attention is given to the features of the A-300-600 series aircraft, which incorporates and A-310 rear fuselage and will replace the A-300 toward the end of 1984. Also considered are (1) the long-term replacements of the A-300 and A-310, the twin-aisle TA-9 and TA-11, respectively, and (2) the single- aisle A-320, which is to be a new design for the short-range market and the precursor of a new family of aircraft in the 125-175 seat range. The A-320 is compared to the 737, DC9 and 757 aircraft. O.C.

A82-16973 # **The justification of the need for ILS by means of cost/benefit methods (Justificacion de la necesidad de un ils mediante tecnicas costo/beneficio).** E. Lallemand Abella. *IAA/Ingeniería Aeronáutica y Astronáutica*, vol. 33, Nov. 1981, p. 33-38. In Spanish.

FAA criteria for the establishment of an Instrument Landing System (ILS) at a given airport have been applied since 1977 in light of cost/benefit studies. The criteria apply to airports with regular jet aircraft traffic which are open to use by general aviation aircraft, and are applicable to other airports in which (1) the number of yearly landing approaches under instrument-only control is greater than a minimum figure and (2) the cost/benfit ratio is better than unity. Attention is given to benefits both annually and in the long term, as well as investment and operating costs. Benefits are defined in terms of regularity of operations and the statistical reduction of accident rates. O.C.

A82-17118 # **A method for locating aircraft wing damage by nonlinear vibration analysis (Ob odnom metode poiska povrezhdenii kryla samoleta, osnovannom na analize ego nelineinykh kolebanii).** S. L. Tsyfanskii, V. M. Ozhiganov, A. B. Milov, and Iu. N. Novikii. *Voprosy Dinamiki i Prochnosti*, no. 39, 1981, p. 3-10. 7 refs. In Russian.

A procedure is proposed for the electrical modeling of the vibrations of a spar wing with a crack. A diagnostic technique based on the spectral analysis of ultraharmonic vibrations is described. V.L.

A82-17124 **Some aerodynamic aspects of hang gliding.** A. Fischer (Dortmund, Universität, Dortmund, West Germany). *Endeavour*, vol. 5, no. 4, 1981, p. 152-157.

Hang gliding began with experiments for spacecraft return to earth using delta wings for gliding. Manipulation of the steering bar on modern hang gliders is outlined, along with the high-strength, light-weight construction. The pointed nose of early gliders is actually suitable only for supersonic craft, and led to the addition of a permanently adjusted elevator to eliminate flap induced dive. Hang glider wings have a lift coefficient of one, a glide angle of 1:10, and a sink ratio of 0.9 m/sec. A progression toward elliptical wings is noted, and designs for semi-rigid and powered gliders are discussed. The addition of a motor leads to stability and thrust axis considerations as well as weight penalties and greater induced drag. Finally, ultralights are mentioned, including the Gossamer and the solar powered aircraft. M.S.K.

A82-17125 **Design procedures for compressor blades (Entwurfsverfahren für Verdichterschaufeln).** H. Starken (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Antriebstechnik, Cologne, West Germany). *DFVLR-Nachrichten*, Nov. 1981, p. 48-51. In German.

The conventional methods for the design of the blades in the case of axial turbomachines are considered, taking into account difficulties concerning the determination of optimal blade profiles. These difficulties have been partly overcome as a consequence of the

A simple method is developed for the design of transonic shock-free airfoil sections based on the analytical hodograph method. Traditional procedure is used in which a compressible flow is built up by transformation from an incompressible analog which is now called a model flow. In view of the defect in existing models such as a circular- or elliptic-cylinder, a new model, YC-profile, is introduced. (Author)

A82-18094 # **Results of a Differential Omega experiment.** T. M. Watt, L. E. Abrams, and F. G. Karkalik (Systems Control, Inc., Palo Alto, CA). In: Symposium on the Effect of the Ionosphere on Radiowave Systems, Washington, DC, April 14-16, 1981, Preprints. Washington, DC, U.S. Naval Research Laboratory, 1981. (4B-3). 12 p. 6 refs.

An experiment was performed to examine the utility of Differential Omega navigation for general aviation in Alaska and Northwest Canada, with emphasis on operational issues. The performance of a prototype Differential Omega system is evaluated for performance parameters such as maximum range of the data link, mean and variance of navigation error, and range decorrelation error. Mean error was observed to be about 0.5 NM, and the standard deviation error was about 0:25 NM. Ground tests yielded results that were consistent with results of earlier experiments, and random errors agreed well with the minimum range results. D.L.G.

A82-18117 **Introduction to V/STOL airplanes.** D. L. Kohlman (University of Kansas Center for Research, Inc., Lawrence, KS). Ames, Iowa State University Press, 1981. 242 p. 161 refs.

After a brief historical account of V/STOL aircraft requirements and experiments, consideration is given to (1) propulsion system devices, such as ducted propellers and augmenting ejectors, (2) operational problems, including ground effects and terminal area operations, (3) takeoff performance and equations for its description, (4) landing performance, relationships, equations and characteristics, and (5) the transition from hover to forward flight, including its equations of motion. Also covered are (6) blowing and suction boundary layer control and powered lift systems, such as jet flaps and blown flaps, propulsive wings and circulation-control airfoils, (7) stability and control in hover and handling qualities criteria, and (8) V/STOL propulsion considerations including number of engines and trends in speciafic fuel consumption and thrust-to-weight ratio. O.C.

A82-18126 **PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record.** Symposium sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1980. 511 p. Members, $25.; nonmembers, $37.50.

Aspects of satellite navigation are examined, taking into account the nonuniform GPS constellation, differential GPS navigation, navigation processing design for a low-cost GPS navigation system, an ionospheric refraction correction model for single-frequency Doppler navigation, a GPS receiver design for general aviation navigation, and geodetic positioning using a global positioning system of satellites. Questions of undersea navigation are investigated, giving attention to gravity gradiometry in a shipboard environment, stochastic and deterministic modeling of gravity gradiometer data, state-space models of gravity disturbance gradients, the astro-geodetic measurement of vertical deflection, the real-time estimation of vertical deflections using a gravimeter, and the laser gyro potential for long endurance marine navigation. Other topics discussed are related to time and frequency as applied to navigation systems, terrestrial-based radio navigation, self-contained navigation, integrated communications and navigation systems, the emerging civil navigation requirements and applications, the navigation of space vehicles, and mapping, charting, and geodesy for navigation systems. G.R.

A82-18132 **A GPS receiver design for general aviation navigation.** B. D. Elrod (Stanford Telecommunications, Inc., McLean, VA), H. A. Bustamante, and F. D. Natali (Stanford Telecommunications, Inc., Sunnyvale, CA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 33-41. 6 refs. U.S. Department of Transportation Contracts No. FA77WAI-757; No. FA78WA-4216.

The NAVSTAR Global Positioning System (GPS) will provide RF transmissions from a constellation of satellites for accurate position, velocity and/or time determination by suitably equipped users. An investigation by the FAA is conducted regarding the potential use of the GPS system for civil navigation to supplement or replace VOR/DME in the National Aerospace System. Of the nearly 200,000 civil aviation aircraft in use today, about 30% are equipped with 'low budget' navigation avionics. One of the objectives of the investigation is related to the development of low cost receiver designs for the navigation requirements of civil aviation. A description is presented of a GPS receiver design satisfying the needs of general aviation navigation. G.R.

A82-18139 **Maneuver dependent component error models and synchronized reset filters for inertial navigation systems.** W. H. Fincke and A. J. Kleinman (Dynamics Research Corp., Wilmington, MA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 107-114.

In many inertial navigation systems (INS), external information in the form of position and/or velocity updates is used in conjunction with an estimation filter to make corrections to the INS to improve accuracy. Attention is given to a design of statistical estimation filters which has been found effective in improving accuracy when there are error sources that are sensitive to vehicle maneuvers. The errors may include reference velocity errors which are speed sensitive, or other errors that may be implemented as part of the navigation reset filter, or as a spacial prenavigate calibration sequence of vehicle maneuvers or platform rotations. G.R.

A82-18141 # **Selecting the post 1990 civil aviation radionavigation system.** J. C. Heurtley and J. W. Bradley (FAA, Office of Systems Engineering Management, Washington, DC). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 177-181.

Investigations are being conducted which are to provide a basis for the selection of the radionavigation system or combination of systems which can best satisfy the requirements of the post 1990 time period. In 1983 the Department of Defense and the Department of Transportation are to make a joint recommendation on the navigation system mix for the post 1995 timeframe. The final area of consideration in selecting the post 1990 Civil Aviation Radionavigation System is the institutional issue. This issue encompasses international acceptance and standards, cost recovery policies, and in the case of NAVSTAR GPS the denial of accuracy, number of satellites, spare satellite policy, and military control of a system used for civil navigation. These issues are still to be resolved. G.R.

A82-18143 **A new end-fire ILS glide slope.** C. B. Watts, Jr. In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 190-197. 8 refs.

The end-fire glide slope described here is a modification of standard ILS ground equipment designed to serve runways where it is not practical to install one of the present conventional systems. The antenna does not use a tower; an array of slotted cable elements is mounted on the runway shoulder, sufficiently low to clear wings and engine nacelles, and is frangible to avoid serious damage to an airplane which might run off the pavement. It is noted that savings in earth movement can amount to many times the cost of the antenna. End-fire development is traced from 1942. C.R.

A82-18144 **Solid-state VORTAC with remote maintenance and monitoring.** A. Lang (ITT Avionics Div., Nutley, NJ) and W. Hundley (Wilcox Electric, Inc., Kansas City, MO). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 198-207.

Because of the widespread use and high capital investments in the VORTAC and VOR/DME system, there are indications that the U.S. and the ICAO will extend these services beyond 1995, the year that protection was to have expired. Owing to problems related to maintenance and the replacement of parts, the FAA let a contract to industry to replace all the old tube-equipped VORs, VOR-DMEs, and VORTACs with a total system architecture that embodies modern technology. The system being produced for the FAA is described. Maintenance costs have been reduced as a result of four improvements: (1) improved reliability of an all solid-state design; (2) improved maintainability through modular construction with automatic fault isolation; (3) reduced maintenance by use of a solid-state and digital circuits; and (4) reduced routine trips by maintenance technicians to each facility, from one or two per week to once per 3 months, as a result of remote certification and maintenance testing. C.R.

A82-18145 **MLS - A new generation landing guidance system is here.** R. M. Cox and J. M. Shirey (Bendix Corp., Communications Div., Baltimore, MD). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 208-215.

The Microwave Landing System (MLS), an air-derived system operating in the C-band, comprises azimuth guidance, elevation guidance, and ranging elements which provide continuous, accurate, three-dimensional position information within a wide coverage volume of the desired landing site. In the Time Reference Scanning Beam (TRSB) MLS, ground-based equipments provide signals to the airborne user from which position information is derived. An important difference between ILS and MLS is angular coverage; ILS is a VHF/UHF system which provides straight-in guidance only on a single fixed glide path. The MLS is a high-frequency microwave system operating at C-band (5031-5090 MHz), providing volumetric coverage over a sector of as much as + or - 60 deg in azimuth and 0-30 deg in elevation. It is noted that a precision DME (L-band, 978-1213 MHz) is available with the MLS to provide accurate range information and thus allow the aircraft to determine its exact position in the prescribed coverage volume. C.R.

A82-18146 **The DME-based Azimuth System /DAS/.** H. Vogel and W. Seith (Standard Elektrik Lorenz AG, Stuttgart, West Germany). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 216-223. 5 refs.

In a competition organized by the ICAO to select a new precision approach and landing system, the DME-based Landing System (DLS) was submitted by the Federal Republic of Germany. Parts of this design were recommended for further development. These elements, which represent the DME-based Azimuth System (DAS), are the L-band precision DME and the 360-deg azimuth service utilizing DLS principles. The DME-based Azimuth System can be regarded as an improved Distance Measuring System (DME) with additional capabilities. The DAS has three essential characteristics: (1) in comparison with the conventional DME, where the measurement errors may amount to several hundred meters, the DAS distance measurement accuracy is considerably improved; (2) the DAS ground station determines with a high degree of accuracy the bearing to the interrogation aircraft and transmits this azimuth information to the airborne station; and (3) the DAS contains a ground-to-air data link. The frequency range is 962-1213 MHz; there are 20 DME frequencies with existing modes and 40 DME frequencies with additional co-channel modes. C.R.

A82-18147 **Flight measurements of Area Navigation System performance using various combinations of ground aids and airborne sensors.** R. A. Harlow (Royal Aircraft Establishment, Bedford, England). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 228-235.

A description is given of flight trials undertaken to determine the accuracy of an Area Navigation (RNAV) System which uses currently available radio aids, and practical aspects of RNAV operation are discussed. Results show that, in an en-route environment, the position-fixing errors made by using Distance Measuring Equipment (DME)/DME navigation were less than half as many as those made in the course of VHF Omnidirectional Range (VOR)/DME navigation. In addition, DME/DME navigation proved to be more accurate than VOR/DME in a Terminal Maneuvering Area (TMA) environment, although the difference was less pronounced in the en-route situation because of the limited ground aids available in the trials area. The trials area was not representative of major European TMAs. The use of inertial velocity information rather than air data signals for the smoothing of RNAV aircraft position estimates was found to give significant accuracy improvements in VOR/DME guidance. O.C.

A82-18150 **Laboratory and flight test of a new RLG strapdown INS.** R. E. Ebner (Litton Systems, Inc., Woodland Hills, CA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 257-263.

A strapdown inertial navigation system using ring laser gyros is tested. Laboratory data are presented showing gyrocompass heading accuracy under differing gyro random walk disturbances, navigation during three-axis Scorsby motion, and navigation following a 180 deg turn. A dominant error source during the Scorsby motion is described, and test data for preliminary gyros which achieve a CEP of 1.4 nmi/h are presented. A new generation system with missile grade RLGs and a third series with higher performance instruments are tested, and the third series demonstrates a performance under 1 nmi/h with a 4 minute reaction time. D.L.G.

A82-18151 **Position extrapolation quality calculation for inertial and Doppler-AHRS navigation systems.** J. Yoh and R. Dunn (Intermetrics, Inc., Warminster, PA). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 280-284.

The Position Extrapolation Quality (PEQ) is defined as the second mean of the second backward difference of the earth-referenced level position error read from the dead reckoner, sampled every thirty seconds. It is noted that because of truncation error in the outputs, this second difference is not available for all dead reckoners to the precision required. In this case, one takes the second mean of the second difference of the integral of the error in reported velocity. When the reporting interval is short, this quantity is equivalent to the other and is affected to a much lesser extent by truncation. Since certain of the underlying processes encountered in most dead reckoner types are not ergodic, it is not possible to evaluate this covariance matrix with a time average. It is necessary to either average over a number of runs with different equipment of the same type or to compute the PEQ using an established model for the type. It is shown here how it is possible to develop reasonable estimates for the PEQ of three types of dead reckoners from statistical models. C.R.

A82-18152 **JTIDS distributed TDMA /DTDMA/ terminal development results with emphasis on relative navigation performance.** J. Rubin and S. Weit (ITT, ITT Avionics Div., Nutley, NJ). In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 285-290. Contract No. N62269-76-C-0106.

Laboratory testing has been completed for Advanced Development Model (ADM) terminals developed for the DOD Joint Tactical Information Distribution System (JTIDS) program. The terminals feature the JTIDS Phase II Distributed Time Division Multiple Access (TDMA) architecture, and include two Class 1 Command and Control terminals, two Class 2 Tactical Fighter terminals, and one JTIDS Environment Simulator. The JTIDS II/D-TDMA operates in Lx-band, from 960 to 1215 MHz, and provides a system that combines spread-spectrum multiple-access command and control functions with conventional TACAN navigation and IFF identification service. Attention is given the Relative Navigation (REL NAV) function of the system, which ties the operations of a tactical community of users to a common relative navigation grid, while optimally blending the fast-response and short-term accuracy of self-contained, dead reckoning navigation with JTIDS-derived position and status reports from multiple users. O.C.

A82-18153 **JTIDS RELNAV network off-line simulation.** J. B. Chadwick (Hughes Aircraft Co., Ground Systems Group, Fullerton, CA). In: PLANS '80 - Position Location and Navigation

A study was initiated to accurately determine the weight percent of pyridine present in pyridine-modified JP-4 used for contractual combustion studies. High Performance Liquid Chromatography (HPLC) was the method of choice. A chromatographic process was developed and systematic quantitative analses performed to substantiate the accuracy and precision of the new test method. A computing integrator interfaced with the HPLC system performed all data collection and calculations automatically, with the results printed on a teletype. Least square curve fitting accentuated the reliability for determining pyridine in the 0.5 to 5.0 weight percent concentration range. Author (GRA)

N82-14318# Naval Postgraduate School, Monterey, Calif.
COMBUSTION BEHAVIOR OF SOLID FUEL RAMJETS. VOLUME 1: CORRELATION OF REACTING AND NON-REACTING FLOW CHARACTERISTICS Final Report
Brian A. Binn, Winston E. Scott, and David W. Wetzer Jul. 1981 68 p refs
(AD-A106061; NPS67-81-010-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 21/2

An experimental investigation was conducted to determine the relationship between the cold flow characteristics of velocity, pressure distribution, and turbulence intensity and the reacting flow performance and combustion characteristics of a solid fuel ramjet. The effects of configuration and air flow changes on the above characteristics were examined. Average regression rates and combustion efficiencies were not significantly affected by changes in configuration. These variations in test conditions significantly affected the centerline turbulence intensity but not the near-wall turbulence intensity in cold flow. Near-wall turbulence profiles in cold flow were found to correlate with the fuel regression profiles in reacting flows. The use of bypass resulted in decreases in regression rate and efficiencies for all cases. Author (GRA)

N82-14333*# Avco Lycoming Div., Stratford, Conn. Materials Lab.
DEVELOPMENT OF IMPROVED HIGH TEMPERATURE COATINGS FOR IN-792 + Hf Final Report
D. D. Profant and S. K. Naik Jun. 1981 95 p refs
(Contract NAS3-22371; DA Proj. 1L1-62209-AH-76)
(NASA-CR-165395) Avail: NTIS HC A05/MF A01 CSCL 11F

The development for t-55 l712 engine of high temperature for integral turbine nozzles with improved thermal fatigue resistance without sacrificing oxidation/corrosion protection is discussed. The program evaluated to coating systems which comprised one baseline plasma spray coating (12% Al-NiCoCrALY), three aluminide coatings including the baseline aluminide (701), two CoNiCrAly (6% Al) + aluminide systems and four NiCoCrY + aluminide coating were evaluated. The two-step coating processes were investigated since it offered the advantage of tailoring the composition as well as properly coating surfaces of an integral or segmented nozzle. Cyclic burner rig thermal fatigue and oxidation/corrosion tests were used to evaluate the candidate coating systems. The plasma sprayed 12% Al-NiCoCrAlY was rated the best coating in thermal fatigue resistance and outperformed all coatings by a factor between 1.4 to 2.5 in cycles to crack initiation. However, this coatings is not applicable to integral or segmented nozzles due to the line of sight limitation of the plasma spray process. The 6% Al-CoNiCrAlY + Mod. 701 aluminide (32 w/o Al) was rated the best coating in oxidation/corrosion resistance and was rated the second best in thermal fatigue resistance. J.D.H.

N82-14371*# United Technologies Research Center, East Hartford, Conn.
EXTERNAL FUEL VAPORIZATION STUDY Final Report
E. J. Szetela and J. A. TeVelde Nov. 1981 92 p refs
(NASA-CR-165513; UTRC-81-915326-15) HC A05/MF A01 CSCL 21D

The feasibility of external fuel vaporization in advanced aircraft gas turbine engines is addressed. Experiments were run to determine key fuel properties including boiling points, dew points, critical temperature, critical pressure, heat transfer coefficients, deposit formation rates, and deposit removal in a flowing system. Of particular concern were the heat transfer rate in the heat exchanger and the performance of the orifice used in the throttling process. Three fuels were utilized in the experiments including Jet-A, Experimental referee broad specification fuel, and a premium No. 2 diesel fuel. Engine conditions representing the NASA Energy Efficient Engine at sea level takeoff, cruise, and idle were simulated in the vaporization system and it was found that single phase flow was maintained in the heat exchanger and downstream of the throttle. Deposits encountered in the heat exchanger represented a thermal resistance as high as .0013 sq M K/watt and a deposit formation rate as high as 600 micro-gC/sq cm hr. These values are equivalent to a buildup of 0.055 cm of thickness in 36 hours resulting in a more severe fouling condition than originally anticipated. It was found that the deposit can be removed by cleaning with air at a temperature of 720 K for 10 minutes. R.J.F.

N82-14388# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
LA RECHERCHE AEROSPATIALE, BI-MONTHLY BULLETIN NO. 1981-2, MARCH - APRIL 1981
Claude Sevestre, ed. Sep. 1981 77 p refs Transl. into ENGLISH of La Rech. Aerospatiale, Bull. Bimensuel (Paris) No. 1981-2, Mar. - Apr. 1981
(ESA-TT-713) Avail: NTIS HC A05/MF A01; original FRENCH report available at ONERA, Paris FF 45

Research in aerodynamics is reported, including: thermal fatigue tests; cryogenic wind tunnels; plate buckling; subsonic flow; thin film transducers for temperature and heat flux measurements; and laser pumping by electron beam discharge.

N82-14394# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
RESEARCH ON AN INDUCTION DRIVEN CRYOGENIC WIND TUNNEL
Alain Blanchard, Jean-Bernard Dor, Andre Mignosi, and Jean-Francois Breil *In its* La Rech. Aerospatiale, Bi-monthly Bull. No. 1981-2, Mar. - Apr. 1981 (ESA-TT-713) Sep. 1981 p 63-77 refs Transl. into ENGLISH from La Rech. Aerospatiale, Bull. Bimensuel (Paris) No. 1981-2, Mar. - Apr. 1981

Avail: NTIS HC A05/MF A01; original FRENCH report available at ONERA, Paris FF 45

The cryogenitization of an induction driven transonic wind tunnel is discussed. Internal insulation and the design of a liquid nitrogen injection system are considered. A unit of 32 injectors is arranged at the periphery of the first diffuser in two rows. Each injector is controlled by a solenoid valve. Several elements can be brought together at the control point to form a 10 bit digital regulation unit. The nitrogen pulses are kept symmetrical by varying the response time of the solenoid valves. This induction system works well, since the increase in nozzle performance compensates increase of flow in the test, section due to the drop in temperature. It should be suitable with nitrogen gas. Composite and homogeneous insulating materials were repeatedly plunged into liquid nitrogen. All reveal defects when exposed to stress induced by differences in the expansion between their internal and external faces. Internal surfaces must be reinforced with polyurethane. Author (ESA)

N82-14424# ITT Avionics, Nutley, N.J.
MODULAR MULTI-FUNCTION MULTI-BAND AIRBORNE RADIO SYSTEM (MFBARS). VOLUME 2: DETAILED REPORT Final Technical Report, Mar. 1978 - Jun. 1980
R. A. Reilly, C. W. Ward, A. Lee, R. Schineller, A. Clemens, W. Robertson, and J. Rome (Lowell Univ.) Wright-Patterson AFB, Ohio AFWAL Jun. 1981 231 p 2 Vol.
(Contract F33615-78-C-1518; AF Proj. 2003)
(AD-A106052; AFWAL-TR-81-1077-Vol-2) Avail: NTIS HC A11/MF A01 CSCL 17/2

A top down, system oriented study of the selected system approach was conducted. System configuration details and performance parameters were refined. In addition, to minimize system development risk and to provide guidance on the best direction among which MFBARS should proceed, recommended plans were defined for development of the system and supporting technology. Emphasis is placed on the final recommended development plans. T.M.

N82-14447*# Virginia Polytechnic Inst. and State Univ., Blacksburg.
MODELING AND ANALYSIS OF POWER PROCESSING

SYSTEMS (MAPPS). VOLUME 1: TECHNICAL REPORT Final Technical Report, Oct. 1977 - Aug. 1980
F. C. Lee, S. Rahman, R. A. Carter, C. H. Wu, Yuang Yu (TRW Defense and Space Systems Group, Redondo Beach, Calif.), and R. Chang (TRW Defense and Space Systems Group, Redondo Beach, Calif.) Dec. 1980 335 p refs
(Contract NAS3-21051)
(NASA-CR-165538; TRW-32680-6001-RU-01) Avail: NTIS HC A15/MF A01 CSCL 09C

Computer aided design and analysis techniques were applied to power processing equipment. Topics covered include: (1) discrete time domain analysis of switching regulators for performance analysis; (2) design optimization of power converters using augmented Lagrangian penalty function technique; (3) investigation of current-injected multiloop controlled switching regulators; and (4) application of optimization for Navy VSTOL energy power system. The generation of the mathematical models and the development and application of computer aided design techniques to solve the different mathematical models are discussed. Recommendations are made for future work that would enhance the application of the computer aided design techniques for power processing systems. A.R.H.

N82-14484# Naval Research Lab., Washington, D. C. Combustion and Fuels Branch.
GENERATION OF ELECTROSTATIC CHARGE IN FUEL HANDLING SYSTEMS: A LITERATURE SURVEY Final Report, 1973 - 1980
J. T. Leonard 24 Sep. 1981 55 p refs
(AD-A106056; NRL-8484) Avail: NTIS HC A04/MF A01 CSCL 05/2

A review is presented on the status of research on the generation and dissipation of electrostatic charge by hydrocarbon liquids and fuels, with emphasis on the period 1973-1980. Both metallic and nonmetallic fuel handling systems are covered, including the special problems encountered in aircraft fuel tanks filled with polyurethane foam. The review stresses recent advances and presents opportunities for future research in some neglected, but nonetheless fundamentals areas affecting the charge generation process. Author (GRA)

N82-14527# Societe Nationale Industrielle Aerospatiale, Suresnes (France). Lab. Central.
CONTROL METHODOLOGY: NONDESTRUCTIVE TESTING IN THE AERONAUTICS INDUSTRY [METHODOLOGIE DE CONTROLE: CONTROLE NON DESTRUCTIF DOMAINE AERONAUTIQUE]
J. Odorico 12 Jun. 1980 39 p refs In FRENCH Presented at l'Ecole d'Ete Franco-Quebecoise Conf., Montreal, 14-23 Jul. 1980
(SNIAS-812-551-110) Avail: NTIS HC A03/MF A01

Quality control in aircraft production using nondestructive tests is considered. Training and administration are covered. Examples of procedures involving suppliers, constructors, and clients are given. Topics include: use of X-rays; holography; examination of alloys; and ultrasonic testing. The need for an integrated approach is stressed, involving client, inspectors, etc. Author (ESA)

N82-14529*# Flow Research, Inc., Kent, Wash.
DEVELOPMENT OF AN EFFICIENT PROCEDURE FOR CALCULATING THE AERODYNAMIC EFFECTS OF PLANFORM VARIATION Final Report
J. E. Mercer and E. W. Geller Washington NASA Dec. 1981 36 p refs
(Contract NAS1-15877)
(NASA-CR-3489; FLOW-RR-186) Avail: NTIS HC A03/MF A01 CSCL 20K

Numerical procedures to compute gradients in aerodynamic loading due to planform shape changes using panel method codes were studied. Two procedures were investigated: one computed the aerodynamic perturbation directly; the other computed the aerodynamic loading on the perturbed planform and on the base planform and then differenced these values to obtain the perturbation in loading. It is indicated that computing the perturbed values directly can not be done satisfactorily without proper aerodynamic representation of the pressure singularity at the leading edge of a thin wing. For the alternative procedure, a technique was developed which saves most of the time-consuming computations from a panel method calculation for the base planform. Using this procedure the perturbed loading can be calculated in about one-tenth the time of that for the base solution. Author

N82-14573*# National Aeronautics and Space Administration, Washington, D. C.
EFFECTS OF AIRCRAFT NOISE ON THE EQUILIBRIUM OF AIRPORT RESIDENTS: SUPPLEMENTARY ANALYSES TO THE STUDY CARRIED OUT AROUND ORLY
J. Francois Sep. 1981 42 p Transl. into ENGLISH of "Repercussion du bruit des avions sur l'equilibre des reverains des aeroports--Analyses complementaires de l'enquete realisee autour d'Orly" Aug. 1977 42 p Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by Inst. Francais d'Opinion Publique, Paris
(Contract NASw-3542)
(NASA-TM-76627) Avail: NTIS HC A03/MF A01 CSCL 13B

The effects of aircraft noise on humans living near airports were studied. Two main questions were considered: do residents give evidence of psychological or physiological disturbances in unusually intense noise sectors; and do personality or health factors account for the high interindividual variability of annoyance? The methodology used and results obtained are presented. Samples of the survey questionnaires are included. E.A.K.

N82-14574*# National Aeronautics and Space Administration, Washington, D. C.
TAKING INTO ACCOUNT NIGHTTIME ANNOYANCE IN THE CALCULATION OF THE PSOPHIC INDEX
Jacques Francois May 1981 30 p ref Transl. into ENGLISH of "La Prise en Compte de la Gene Nocturne dans le Calcul de l'Indice Psophique" Rept., France, Feb. 1977 p 1-33 Transl. by Kanner (Leo) Associates, Redwood City, Calif. Original doc. prep. by Inst. Francaise d'Opinion Publique (IFOP), Paris
(Contract NASw-3199)
(NASA-TM-76580) Avail: NTIS HC A03/MF A01 CSCL 13B

The annoyance factor caused by air traffic noise on the residents of areas near airports is discussed. The psophic index is used to predict the level of overall annoyance suffered on the average by residents around airports. The calculation method differentiates between daytime and nighttime annoyance. E.A.K.

N82-14783# Air Force Geophysics Lab., Hanscom AFB, Mass. Mesoscale Forecasting Branch.
THE MODULAR AUTOMATED WEATHER SYSTEM (MAWS) CONCEPT
Donald A. Chisholm, Richard H. Lynch, and James C. Weyman *In* ESA Nowcasting: Mesoscale Observations and Short-Range Prediction Jun. 1981 p 303-307 refs

Avail: NTIS HC A19/MF A01; ESA, Paris FF 180 Member States, AU, CN and NO (+20% others)

A modular automated weather system (MAWS) which is a supervisory microprocessor that manages, disseminates and archives visibility, wind, temperature, and dew point measurements as well as outputs from ceilometers, transmissometers, digital altimeters, and digital clocks is discussed. Results are assessed for: (1) aviation weather elements and sensors suitable for automation; (2) sensor siting requirements for aviation critical weather elements; (3) performance potential of microprocessor components, display devices and communication systems; (4) the importance of met watch parameters in support of aviation operations; and (5) utility of short range forecast guidance based on simple statistical models. A microprocessor based MAWS system satisfies most automated observation requirements and provides an essential data base for the development of operational prototypes. Author (ESA)

N82-14817*# California State Univ., Fullerton. Dept. of Management Science.
REAL TIME SIMULATION OF COMPUTER-ASSISTED SEQUENCING OF TERMINAL AREA OPERATIONS Final Report, Jul. 1978 - Jan. 1981
Roger G. Dear 31 Jan. 1981 115 p refs
(Contract NCA2-OR253-001)
(NASA-CR-166185) Avail: NTIS HC A06/MF A01 CSCL 05B

Computer program for aerodynamic and blading design of multistage axial-flow compressors [NASA-TP-1946] N82-15039
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simulation of certain subsystems. The hot bench is a well known development, test, and integration tool for real-time avionics systems. The simulation software portion of the Hot Bench is discussed. G.R.

A82-19245 **Radar environment simulation for software test.** W. D. Horner (Westinghouse Defense and Electronic Systems Center, Baltimore, MD). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 341-343.

Real-time radar environment simulations are used to speed up the software integration and debug phase of radar system development. The entire radar environment can be simulated for the operational flight program (OFP) resident within the fire control radar computer (RC) by physically connecting the RC to a simulation support computer through special purpose hardware interfaces. A description is provided of some of the capabilities of a radar environment simulation used in conjunction with actual embedded radar computer hardware. The real power of the simulation lies in its organization which makes it possible to make use of the hardware freeze capability, within the embedded computer. G.R.

A82-19253 **A fuel control system designers approach to gas turbine engine computer model validation.** R. M. Evans (Aviation Electric, Ltd., Montreal, Canada). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 532-537. Department of Industry, Trade and Commerce Contract No. 9ST79-00058.

A hybrid computer model of a gas turbine driving a helicopter rotor system is assembled and shown to be an accurate simulation in both steady state and transient modes of operation when compared to actual engine data. A fuel controller is designed, which employs innovative control mode concepts using the engine model to define the control mode concepts using the engine model to define the control mode parameters. The basic structure of the model is shown to be sound and applicable to other types of gas turbines. D.L.G.

A82-19256 **SIMATR - An air battle simulation of the USAF Tactical Air Control System /TACS/ with Advanced Tactical Radars.** J. Golub, D. M. Greeley, and B. B. Levy (RCA, Missile and Surface Radar Div., Moorestown, NJ). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 636-641.

The objective of SIMATR (Simulation of Integrated Multiple Advanced Tactical Radars) is to demonstrate the value of a network of Advanced Tactical Radars (ATRs) in an air battle through the increased effectiveness of the interceptors in repulsing the attack. This increased effectiveness is attained by directly controlling and designating the airborne interceptor radar to provide the interceptor a relatively free and unanswered first shot of an air-to-air weapon. The basic SIMATR operation is described, and an example is provided of defensive force reaction to a massive enemy air attack. System enhancements that may further expand its capabilities and increase its effectiveness are discussed. C.R.

A82-19259 **Simulation of advanced cockpits.** J. M. Reising (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and L. Hitchcock (FAA, Technical Center, Atlantic City, NJ). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 662-665. 5 refs.

The development of advanced digital graphics and displays which utilize the capabilities of full-color, computer generated pictures is described. The transition is being made from electromechanical displays and associated numerical formats to electro-optical displays which employ advanced symbols and special algorithms for real-time projection. Pictorial formats provide intuitive, simple representations of how the aircraft is performing, its situation relative to other traffic, the presence of ground obstacles, and emergencies and remedial procedures. New formats are recommended to be screened in a two stage evaluation involving mock-ups and simulators, and are subjected to pilot scrutiny to determine acceptability. The digital Synthesis Facility is described, including the use of an A-7 cockpit and a PDP-11/50 computer system for real-time simulation of A-7 flight. M.S.K.

A82-19260 * **Real-Time Simulation Computation System.** J. L. Fetter (NASA, Ames Research Center, Moffett Field, CA). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 666-670. 9 refs.

The Real-Time Simulation Computation System, which will provide the flexibility necessary for operation in the research environment at the Ames Research Center is discussed. Designing the system with common subcomponents and using modular construction techniques enhances expandability and maintainability qualities. The 10-MHz series transmission scheme is the basis of the Input/Output Unit System and is the driving force providing the system flexibility. Error checking and detection performed on the transmitted data provide reliability measurements and assurances that accurate data are received at the simulators. D.L.G.

A82-19263 # **Experience with flight simulators - Training effectiveness-future developments.** J. F. Smith (USAF, Human Resources Laboratory, Williams AFB, AZ). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-110.* 12 p.

The progress, development, and effectiveness of flight simulators are examined from the introduction of the Link trainer to predictions of future directions and capabilities. The first six simulators were delivered in 1934 and by WW II congressional reports asserted that armed service savings in manhours and expenses were in millions of hours and hundreds of millions of dollars. Electronic simulation began after WW II, and with the arrival of jet aircraft, simulators were used for instrument and procedures training, as well as weaponry and refueling operations. Visual representations were added in the 1970's, along with low-level flight cuing, manual reversion problems, and remote operation of a simulator from different bases. Recommendations are provided for optimized use of present simulators, and the employment of simulators as testing grounds for pilots, for total environment simulation, and the development of part-task trainer systems in the future are discussed. M.S.K.

A82-19264 # **Cost efficiency versus objective fidelity in flight simulation (Kosteneffektivität gegenüber objektivem Realismus bei der Flugsimulation).** G. Dörfel and H. Distelmaier (Forschungsinstitut für Anthropotechnik, Wachtberg-Werthoven, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-104.* 15 p. 8 refs. In German.

The effect of the objective fidelity level on the simulation cost is considered, taking into account relative cost as a function of motion fidelity and visual scene fidelity levels. Cost considerations make it necessary to conduct an investigation regarding the degree to which an achievement of objective fidelity is desirable for flight simulation processes. It has to be taken into account that the simulator is not an aircraft copy, but any educational device employed to obtain a certain objective regarding the training of a pilot. A study is required regarding the approaches needed to achieve this objective, taking into account the extent of the information which has to be presented and the effect of the various cues on the pilot and his performance. Previous investigations show that subjective fidelity can help to achieve, at a lower cost, training results of the same quality as objective fidelity. These conclusions apply to full-mission simulators and to part-time training devices. G.R.

A82-19265 # **Properties of the new flight and tactics simulators (Eigenschaften der neuen Flug- und Taktiksimulatoren).** H.-J. Balke (Bundesamt für Wehrtechnik und Beschaffung, Koblenz, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-106.* 17 p. In German.

In the 1970s, the Armed Forces of the Federal Republic of Germany have placed orders for many simulators, which are currently being used or which will be received in the next few years. All new simulators employ exclusively digital computers. The combined use of display and computer makes the simulator an efficient training device. A pilot can draw conclusions regarding the flight conditions of the aircraft on the basis of the aircraft motions perceived by him. Facilities are provided which make it possible for the pilot to practice such a utilization of aircraft motions in the simulator. The employed kinematic system performs motion processes involving 6 degrees of freedom. The G-seat in connection with the G-suit can convey to the pilot the impression that he is flying at accelerations greater than 1 g. Attention is also given to equipment used to make the aid of the instructor more effective, aspects of radar simulation, and the simulation of electronic warfare situations. G.R.

A82-19266 # **Procurement of the new flight and tactics simulators - Experience, problems, meaning (Beschaffung der neuen Flug- und Taktiksimulatoren - Erfahrungen, Probleme, Sinn).** H.-J. Balke (Bundesamt für Wehrtechnik und Beschaffung, Koblenz, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-095.* 8 p. In German.

The stationary flight and tactics simulator is used for the training of flight crews. An aircraft cockpit is employed, while electronic computers simulate the behavior of the aircraft, the characteristics of the aircraft equipment, and the operation of the engine. A number of similar appearing names are employed for simulators and other training devices. It is, therefore, sometimes difficult to distinguish between training devices for ground personnel and the simulators for flight crews. A description of the meaning of the various terms employed in this connection is provided as an aid for the appropriate identification of a device. Attention is given to market considerations regarding the purchase of simulators, details concerning the simulator procurement process, and the benefits obtained by an employment of flight and tactics simulators. G.R.

A82-19267 # **Requirements regarding digital external view systems for full mission flight and tactics simulators (Anforderungen an Digitale Aussensichtsysteme für Full Mission Flug- und Taktiksimulatoren).** P. Güldenpfennig (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-100.* 14 p. In German.

During the time period from 1975 to 1977 a computer-generated image (CGI) system for the training simulator Tornado was developed by an aerospace company in West Germany. A school for the study of weapon systems, four squadrons of the German Air Force, and two squadrons of the German Navy were equipped with flight and tactics simulators for the training of Tornado crews. The principal combat objectives for the Tornado aircraft are related to the performance of battlefield interdiction and strike missions. A CGI system prototype is considered along with an evaluation of the CGI system prototype by pilots of the German Air Force and Navy. The results of the evaluation are discussed, taking into account each of the various types of operation to be performed with the aircraft. The evaluation led to the formulation of requirements for new technical system parameters. The specified requirements are related to an enhancement of the data base storage capacity, image improvement, improved resolution, and the employment of texturing and curved shading. G.R.

A82-19268 # **The procurement of flight simulators at the German Lufthansa (Die Beschaffung von Flugsimulatoren bei der Deutschen Lufthansa).** W.-D. Hass (Deutsche Lufthansa AG, Frankfurt am Main, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-093.* 10 p. In German.

Flight simulators have become indispensable for the training of airline pilots. Questions regarding the requirements for flight simulators arise, therefore, in connection with the introduction of new aircraft types or the enlargement of the fleet of existing aircraft types. Decisions have to be made concerning the placing of an order for a simulator or the purchase of simulator time on devices of the aircraft manufacturer or other companies. It is advisable to specify in the contract covering the purchase of the aircraft that the aircraft manufacturer has to provide data and components to a flight simulator producer. With respect to the Lufthansa, during the last 15 years there was almost always a relationship between the orders for an aircraft and a simulator. Price and delivery information from simulator manufacturers is obtained as soon as the negotiations regarding the purchase of aircraft appear to lead to a concrete agreement. Attention is given to procurement specifications, evaluation criteria, and a point system for an evaluation. G.R.

A82-19269 # **Flight simulation consoles, aid or obstruction - Objective evaluation of control consoles of modern flight and tactics simulators (Flugsimulatorbedienkonsolen, Hilfe oder Behinderung - Objektive Bewertung von Bedienkonsolen moderner Flug- und Taktiksimulatoren).** B. Heger, A. L. Lippay, M. McKinnon, A. Del Mar, and R. Glass (CAE Electronics GmbH, Stolberg, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-097.* 24 p. In German.

An investigation was conducted with the objective to develop a model for the evaluation of control consoles at training simulators, taking into account the function of the console as human-machine interface. The obtained information is to be used in connection with the development of new control consoles. The investigation made use of System Analysis by Integrated Network of Tasks (SAINT) to analyze the operational stress to which an instructor is subjected during the training. The tasks of the instructor were divided with respect to typical activity modules. Each task could be assigned to any arbitrary control device. The described approach makes it possible to determine the time required for the performance of each task. The number of tasks performed or omitted in connction with a lack of time can be obtained along with the causes for an overload. The results obtained indicate various nonoptimal conditions, which are related to existing design characteristics and an inappropriate division of tasks between man and machine. G.R.

A82-19270 # **Data base generation for digital external view systems (Datenbasisgenerierung für digitale Aussensicht-systeme).** U. List (Bundesamt für Wehrtechnik und Beschaffung, Koblenz, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-101.* 14 p. 6 refs. In German.

Flight simulators make increasing use of systems which provide the pilot with a computer-generated image in simulation of the external scene which the pilot would perceive from the cockpit of the aircraft. Realistic impressions of motion are conveyed. The degree of realism achieved in the image is essentially determined by the processing capacity of the employed system. The realism of representation could be improved in connection with advances in electronics and automatic data processing made during the last few years. A computer-generated image system prototype is discussed along with the data base generation system (DBGS) used with it. Attention is given to the DBGS hardware configuration, the automatic transformation procedure, aspects of interactive processing, and questions of data base verification. The DBGS uses as a basis for its operation magnetic tapes with topographic information along with maps, aerial photographs, and other photographs. G.R.

A82-19271 # **Official recognition and the significance of simulators for safe flight operations (Die behördliche Anerkennung und der Stellenwert von Simulatoren für den sicheren Flugbetrieb).** G. Voss (Luftfahrt-Bundesamt, Braunschweig, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-094.* 8 p. In German.

The evolution of the flight simulator since its first introduction in the 1950s is considered. It is pointed out that the performance of modern flight simulators exceeds greatly the requirements for simulators described in the original definition of the International Civil Aviation Organization. The possibilities provided by the simulators for a replacement of flight training led to regulations by the appropriate authorities in the various countries regarding the use of flight simulators in training leading to the licensing of pilots. Attention is also given to the procedures to be followed for the testing of simulators to obtain official recognition. Test guides and, perhaps, even simulator self-test processes developed by the simulator industry would make it possible to reduce the time and work aerodynamic forces and surface blow back, and 200 types of malfunction. Simulator hardware changes to upgrade the computer, the motion simulation, control loading, sound, and visual fidelity are examined. Finally, actual implementation of the Phase II regulations are discussed, noting that the goal is to make the training simulation experience more thorough than will actually be encountered in flight. M.S.K.

A82-20537 **An independent view of where civil simulation should be headed.** J. A. Carrodus (Cathay Pacific Airways, Ltd., Hong Kong). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981. London, Royal Aeronautical Society, 1981. 5 p.

Deficiencies in the optimal use of simulators are discussed and suggestions for improvements in the use of simulators are offered. The inadequacies in validation documents for testing the fidelity of one variable factor against another in a dynamic program are examined, and a remedy is found in obtaining validation data from the aircraft manufacturer. Recommendations are also offered that simulator construction be given the same lead time as the aircraft they simulate, while manufacturers should also supply qualified pilots who can validate the simulator programs for conditions outside of the normal flight envelope. Error checking is emphasized, as are buffet and motion realism, sound reproduction fidelity, meeting development schedules, and provisions for automatic testing. Finally, maintenance in simulators is reviewed, along with government oversight agencies to uphold the integrity of simulator training. M.S.K.

A82-20540 **Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980.** Symposium sponsored by the Royal Aeronautical Society. London, Royal Aeronautical Society, 1980. 99 p.

Topics discussed include the airworthiness of helicopter transmissions, the application of condition monitoring, and the minimum-cost performance monitoring of turboshaft engines. Consideration is also given to single-shot diagnostics, helicopter transmission philosophy, and on-site vibration measurement, dynamic tracking and balancing. J.F.

A82-20541 # **Airworthiness of helicopter transmissions.** P. D. Vinall (Civil Aviation Authority, London, England). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 30 p.

The fatal accident rates caused by the rotor and transmission systems of rotorcraft are almost an order of magnitude worse than those of fixed-wing aircraft. This is in part due to the single load path characteristics of the vehicle. Redundancy in the transmission system would mean, however, a change in the current design practice and the possible disadvantages of increased weight and complexity. The standards achieved on rotorcraft transmissions bear comparison with experience on similar dynamic components in turboprop engines. Safety considerations are of greater significance in a helicopter, however, and these aircraft should have higher standards for airworthiness. It is suggested that there be manufacturing control of critical parts for rotorcraft, and that transmissions not be used as a source of power for accessory functions which might reduce the integrity and reliability of the transmissions. Better diagnostic aids should also be established, including an in-flight indicator of transmission condition and a periodic vibrographic oil and sonic analysis. J.B.

A82-20542 # **The application of condition monitoring.** A. T. Dalton (Civil Aviation Authority, London, England). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 14 p.

The development in the application and management of in-service maintenance of commercial helicopters has lagged the advancements in design and operation. The Primary Maintenance Process is discussed in detail, emphasizing its three primary maintenance processes: (1) hard time maintenance for known deterioration; (2) on-condition inspection at regular intervals; and (3) condition monitoring, which relies on in-service information analysis. The primary processes (1 and 2) are applied in detail to each item of a helicopter, after which condition monitoring (3) is used as a secondary surveillance activity for engineering management. It is maintained that formalized application of condition monitoring to safely develop maintenance tasks will reduce costs and promote deregulation by delegation of certain activities to the helicopter operator under controlled program conditions. J.F.

A82-20543 # **Quick learning diagnostics.** R. M. Stewart (Southampton, University, Southampton, England). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 14 p.

Single-shot diagnostics implies the ability to judge the state or condition of a component on the basis of one measurement and without reliance on past history. Vibration patterns that signal the existence of a fault and the nondimensional numbers to encode them are found; use of both patterns and numbers reduces the data storage requirement, since the diagnosis is independent of past history, machine speed/load and monitoring position. Noise reduction and multiple techniques are developed to permit inspection of more complex machines. Single-shot diagnostics was used to monitor the vibrations of a gear box and a rolling contact bearing. In the former, the pattern recognition procedure resulted in the production of a true nondimensional number; in the latter, mere detection of the pattern was considered sufficient. Both cases required a great deal of computation, first during the primary phase of signal averaging or power spectrum analysis, and then in the secondary phase of reducing the complicated primary signature to a simple statement: acceptable or unacceptable. J.F.

A82-20544 # **Minimum cost performance monitoring of turboshaft engines.** H. I. H. Saravanamuttoo (Carleton University, Ottawa, Canada). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 13 p.

A low-cost Engine Health Monitoring system for turboshaft engines is presented, which is suitable for use by small operators who do not have access to computing facilities. Two approaches are discussed, Gas Path Analysis (GPA) and Trend Analysis, according to which measurements are made of the power fuel flow, inlet conditions, pressure levels, and temperatures. GPA is shown to be the more powerful method, but requires extra instrumentation. Fuel flow errors can be detected either by a large increase in airflow or an increase in turbine efficiency. Fuel flow proved to be the most critical measurement (a 1% error gave a 1.4% error in airflow, whereas a 1% error in power only gave a 0.4% error in airflow). This lower sensitivity to power errors results since GPA deduces the airflow from the gross power developed by both turbines, and power absorbed by the compressor is usually greater than that absorbed by the rotor. Trend Analysis, on the other hand, requires no extra instrumentation, but when applied with good judgement, can indicate troubles before they become critical. J.F.

A82-20545 # **On-site vibration measurement, dynamic tracking and balancing.** N. E. Trigg (Helitune, Ltd., Fleet, Hants., England). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 10 p.

Undetected vibration can severely damage expensive and often unobtainable major components, resulting in lengthy, costly, and untimely overhauls. Old and new methods of vibration analysis and tracking are compared, and the various techniques and equipment used by these methods are discussed: flag tracking, hand-held vibrograph, the Scientific Atlanta Vibration Signature Analyzer. The latter instrument provides a hard copy of vibration signatures recorded in the vertical, lateral, and fore and aft planes; by relating the peaks of the signatures to a vibration order sheet, the sources of vibration can be found and sharply reduced. Out-of-track and out-of-balance conditions in the main and tail rotors can be pin-pointed with accuracy and eliminated. The future will involve microprocessors to interpret the data more rapidly and give instructions for speedy tuning. J.F.

A82-20546 # **Helicopter transmission philosophy - The way ahead.** B. A. Shotter (Westland Helicopters, Ltd., Yeovil, Somerset, England). In: Helicopter transmissions; Proceedings of the Symposium, London, England, February 6, 1980. London, Royal Aeronautical Society, 1980. 10 p.

Factors influencing the design of a helicopter transmission system are discussed. The power and speed of the slowest output are of primary importance since these define the maximum torques where the highest weights are likely to be found. The physical arrangement of the aircraft usually demands that the engine axis be near-horizontal, while the main rotor axis be near-vertical; one stage of gearing will therefore be concerned with changing the rotation axis. The physical form of the system is also influenced by the rotor control principles and the nature of the forces emanating from the rotor. The system should also have a light weight, high reliability, a minimum amount of maintenance, and a long life. Improvements in materials can contribute to a consistent performance, and a simple system, based on a large number of units of the same design, will make the unit more problem-free. J.F.

A82-20551 **Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981.** Symposium sponsored by the Royal Aeronautical Society, Royal Institution of Naval Architects, and Airship Association. London, Royal Aeronautical Society, 1981. 114 p.

After giving an historical account of the development of rigid and non-rigid airship design, the conference covers the application of airships to offshore military and economic activities such as those defined by the Third U.N. Conference on the Law of the Sea, the incorporation of modern technologies into maritime patrol airships, comparisons of airships and conventional aircraft in maritime roles off the Japanese Archipelago, and possibile military roles for airships of various designs in the Royal Navy. Consideration is also given the airworthiness of airships under severe flight conditions, the design of a surveillance airship for duty in the area of New Zealand, and the design characteristics and operational capabilities of the Skyship 500 airship. O.C.

A82-20552 **An introduction to the airship.** E. Mowforth (Airfloat Transport, Ltd., Guildford, Surrey, England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 8 p.

This paper seeks to indicate some of the principal design parameters and operational characteristics of the airship, making particular reference to those features relevant to maritime applications. The greater part of the presentation is devoted to the traditional airship geometry, typified historically by for example the Goodyear 'blimps' and the Hindenburg'; structural categories for this form will first be described, leading to a survey of selected operational aspects, a brief historical account of the use of airships in a maritime context, and some comments on the performance to be expected from the conventional configuration. The paper will then conclude with a short look at some of the modern proposals deviating from the traditional concept, particularly at 'hybrid' designs. (Author)

A82-20553 **Offshore uses of the airship.** M. B. F. Ranken (Aquamarine International /Fisheries and Ocean Development/, Ltd., London, England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 12 p. 42 refs.

An assessment is made of the application of airships to the maritime surveillance tasks made neccessary by the definition of exclusive economic zones (EEZs) for coastal states by the Third U.N. Conference on the Law of the Sea. It is suggested that the fuel economy, long mission durations, and large horizon for radar use make airships attractive tools in the implementation of surveillance within the EEZs. Attention is given the construction, operation and crew training cost advantages of airships, the ease with which avionics and specialized electronic surveillance equipment can be accomodated in an airship gondola, and the all-weather operational capabilities of modern airships. O.C.

A82-20554 **Studies of modern technology airships for maritime patrol applications.** D. B. Bailey (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA), K. E. Williams, and L. J. Nivert (U.S. Coast Guard, Washington, DC). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 12 p. 24 refs.

The energy efficiency of airships has prompted the reexamination of their capabilities in maritime patrol roles, in light of competition from hydrofoil, surface effect, and small waterplane area ship designs. Based on the past performance of airships and the incorporation of modern technology for propulsion, structures, materials and flight controls, it is assumed that the new airships would be capable of hover, VTOL operation, a 90-knot maximum speed, sensor and vessel towing, and all-weather flight. The lifting gas considered is 95% pure helium. Studies concerning vehicle sizing, estimated life cycle costs, and vehicle case studies are invoked by conclusions which recommend that (1) airship flight demonstrations be conducted for technical and operational validation, and (2) that analyses be conducted of such operational and logistic factors as crew training, maintenance, basing and utilization. O.C.

A82-20555 **The airship - Its application and promotional activity.** K. Iinuma (Japan Buoyant Flight Association, Japan). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 7 p.

The opportunities for airship operation in the Japanese Archipelago are assessed, with a view toward more economical fulfilment of territorial waters control and maritime surveillance requirements than present YS-11 and 737 conventional aircraft. Attention is given the use of airships in traffic between the main islands and small outlying islands. The airship design assumed in all comparisons and estimates is a four-rotor, helistat-type craft incorporating a buoyant hull with vectorable, helicopter-like propellers. O.C.

A82-20556 **The uses of airships in the Royal Navy.** B. Shaw (Ministry of Defence /Navy/, London, England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 6 p. 7 refs.

An assessment is given of the operational capabilities offered by airships incorporating new materials and novel design concepts, in the context of the NATO roles to which the British Navy is commited in the North Atlantic. In addition to considering ASW, mine warfare, flying command communications center and RPV-carrying functions, attention is given to the structural design of an airship whose service altitude would be 15,000 ft. The structural configuration consists of a carbon fiber-reinforced plastic central beam, which would support the hull envelope by means of circular frames attached to the beam by radial wires. Design suggestions are also made for a low-level airship with four vectorable rotors. Emphasis is placed on the advantages of airships in the airborne early warning role and in the role of logistics support for ships at sea. O.C.

A82-20557 **Airworthiness of airships.** E. J. Niedermayer (Civil Aviation Authority, London, England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 6 p.

Criteria under consideration by the British Civil Aviation Authority with a view of establishing airship airworthiness and safety requirements for certification of future commercial designs are presented. Emphasis is put on the airship hull's ability to withstand storm-strength gust conditions, and of the control surfaces' ability to establish sufficient stability under those conditions. It is noted that the velocities of up- and down-drafts in the center of a severe thunderstorm may reach 3000 ft/min at the 3000 ft altitudes at which airships traditionally cruise. Attention is also given to the free-balloon condition that results from total engine failure, and to the establishment of operational limitations concerning maximum rates of climb and descent, minimum turn radii, and minimum clearance space for take-off and landing. O.C.

A82-20558 **A surveillance airship for the New Zealand environment.** P. W. C. Monk (Airship Industries, Ltd., Isle of Man, *Sinica*, vol. 2, Sept. 1981, p. 84-93. In Chinese, with abstract in English.

The results of a simulation study of a triple redundant flight control system are reported. The system featured the capability of fail-operation and employed three on-line signal selectors, six off-line comparators, and an active standby servomechanism. The signal selector consisted of operational amplifiers, and the triplex system involved the selection of an intermediate voltage transmitted among three input signals. All failure signals were isolated and neglected, while a servo loop was employed to compare a servo model with the active-standby servomechanism. The signal selectors, comparators, and servomechanism provided adequate performance, within the bounds that the active-standby servomechanism be limited to control functions which accept small failure transients. M.S.K.

A82-22198 † **The use of Doppler spectroscopy to study the characteristics of the polydisperse characteristics of emulsion water and solid microimpurities in aviation fuels (Primenenie metoda Doplerovskoi spektroskopii dlia issledovaniia kharakteristik polidispersnosti emul'sionnoi vody i tverdykh mikroprimesei v aviatoplivakh).** A. N. Korolevich, T. V. Oleinik, and A. Ia. Khairullina. *Zhurnal Prikladnoi Spektroskopii*, vol. 35, Dec. 1981, p. 1016-1023. 11 refs. In Russian.

The feasibility of using Doppler spectroscopy to determine drop sizes of emulsion water and particle sizes of solid microimpurities in kerosene flow through a pipe is confirmed. Measured Doppler spectra are used to reconstruct particle size distribution functions for fractions of microparticles beginning with 2 microns. The method makes possible the rapid continuous monitoring of the disperse phase in aviation fuel and may be suitable in the automated analysis of multicomponent disperse media. B.J.

A82-22209 # **Rotating stall in blade rows operating in shear flow.** T. Sekido (Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan), I. Sasaki, and H. Takata (Tokyo, University, Tokyo, Japan). *JSME, Bulletin*, vol. 24, Dec. 1981, p. 2074-2081.

The nature of the unsteady small perturbations in a sheared mean flow with a linear velocity profile is investigated. The results are used to analyze the actuator-disk of a rotating stall in three-dimensional blade rows which are placed in cartesian coordinates and are exposed to a spanwise shear flow. It is assumed that the blades have no twist and that the aerofoil section does not vary with radius. The axial velocity is continuous everywhere on the actuator plane, and the exit flow angle is constant as well as independent of both the inlet flow angle and the spanwise position. The total pressure loss is assumed to arise through the blade row, and is related to the flow by the total pressure loss coefficient. It is shown that the three-dimensional effect in shear flow greatly changes the nature of the rotating stall. Spanwise distribution of the disturbances of the rotating stall in shear flow is also examined. J.F.

A82-22222 **Can low-speed jet noise be predicted (Peut-on prédire le bruit d'un jet quelconque de faible fitesse).** J. M. Fitremann (Ecole Nationale Supérieure de Mécanique, Nantes, France). *(Association Aéronautique et Astronautique de France, Colloque d'Acoustique Aéronautique, 7th, Ecole Centrale de Lyon, Ecully, Rhône, France, Nov. 4, 5, 1980.) Revue d'Acoustique*, vol. 14, no. 58, 1981, p. 145-152. 18 refs. In French.

Attempts to analytically define the noise emitted by a turbulent jet and the refraction of noise off the surface of an aircraft are discussed. Modeling turbulent flow for a given geometry is nominally accomplished by applications of theories of radiation and turbulent shear flow, and of three-dimensional refraction phenomena. Turbulent flow is calculated from average flow, energy, dissipation, and time and length scales, with reference to known flows, and by making quadruple correlations; stress, mixed, algebraic, and linear diffusion models are possible. Turbulent spectral quantities are calculated at discrete points volumetrically, and the spatial and temporal characteristics are quantified as the acoustic spectra diverge from the main flow. Inhomogeneous radiation is described by Lighthill's theory. Nonlinear propagation phenomena are quantified in terms of fields of average velocities or densities, of simple or nonlinear, multiple diffusion, for random fluctuations in amplitude and phase, and from spectral broadening of pure frequencies during refraction. M.S.K.

A82-22240 * **Deposit formation in liquid fuels. II - The effect of selected compounds on the storage stability of Jet A turbine fuel.** J. H. Worstell and S. R. Daniel (Colorado School of Mines, Golden, CO). *Fuel*, vol. 60, June 1981, p. 481-484. 30 refs. Grant No. NsG-3122.

The influence of substituted pyridines, pyrroles, indoles, and quinolines on the storage stability of conventional Jet A turbine fuel is evaluated. Significant increases in the amount of deposit formed in accelerated storage tests are found upon addition of these compounds at levels as low as one ppm nitrogen. While the effect is correlated with basicity of the nitrogen compound within a given compound class, the correlation does not hold between classes (pyridines, quinolines, etc.). Steric hindrance at the nitrogen atom greatly inhibits deposit promotion. The characteristics, but not the elemental composition, of deposits vary with the identity of the added nitrogen compound and with deposition temperature. (Author)

A82-22241 * **Deposit formation in liquid fuels. I - Effect of coal-derived Lewis bases on storage stability of Jet A turbine fuel.** K. E. Dahlin, S. R. Daniel, and J. H. Worstell (Colorado School of Mines, Golden, CO). *Fuel*, vol. 60, June 1981, p. 477-480. 24 refs. Grant No. NsG-3122.

The development of reasonably precise techniques for the measurement of storage stability of jet aviation fuel is described. Lewis bases, extracted by ligand-exchange from a coal-derived liquid, are shown to adversely affect storage stability (as determined by an accelerated storage test) when added to Jet A turbine fuel. JFTOT results suggesting slight decreases in thermal stability of fuel 'spiked' (i.e., contaminated with a measured quantity of reagent) with extract are reported. Addition to Jet A turbine fuel of individual heterocyclic nitrogen compounds is shown to produce comparable decreases in storage stability. (Author)

A82-22245 # **Aerodynamic evaluation of winglets for transport aircraft.** J. A. Dahlin (Douglas Aircraft Co., Long Beach, CA). *American Institute of Aeronautics and Astronautics, Fluid and Plasma Dynamics Conference, 14th, Palo Alto, CA, June 23-25, 1981, Paper 81-1215.* 7 p. 8 refs.

The applications of winglets to new and existing transport aircraft are discussed. The calculation of induced drag of highly nonplanar lifting configurations (i.e. wing/winglet combinations) using the Trefftz-Plane (far-field) method is substantiated. Further, it is established that the method of surface pressure integration to calculate induced drag characteristics is unreliable. A trade study evaluating the effects of winglet dihedral and span on induced drag and wing root-bending-moment characteristics is presented. The effect of wing loading on winglet performance and the resulting implications to existing transport aircraft is discussed. Comparisons of predicted and measured (wind tunnel and flight) induced drag improvements due to winglet and wing-tip extensions are presented for the KC-135 and DC-10 aircraft. (Author)

STAR ENTRIES

N82-16042*# Boeing Vertol Co., Philadelphia, Pa.
PREDESIGN STUDY FOR A MODERN 4-BLADED ROTOR FOR THE NASA ROTOR SYSTEMS RESEARCH AIRCRAFT
H. E. Bishop, J. E. Burkam, R. C. Hemingway, C. N. Keys, K. E. Smith, J. H. Smith, and J. A. Staley Jan. 1981 312 p refs
(Contract NAS2-10689)
(NASA-CR-166153) Avail: NTIS HC A14/MF A01 CSCL 01B

Trade-off study results and the rationale for the final selection of an existing modern four-bladed rotor system that can be adapted for installation on the Rotor Systems Research Aircraft (RSRA) are reported. The results of the detailed integration studies, parameter change studies, and instrumentation studies and the recommended plan for development and qualification of the rotor system is also given. Its parameter variants, integration on the RSRA, and support of ground and flight test programs are also discussed. Author

N82-16043*# Hughes Helicopters, Culver City, Calif.
PRE-DESIGN STUDY FOR A MODERN FOUR-BLADED ROTOR FOR THE ROTOR SYSTEM RESEARCH AIRCRAFT (RSRA) Final Report
Charles W. Hughes and Andrew H. Logan Mar. 1981 140 p refs
(Contract NAS2-10690)
(NASA-CR-166154) Avail: NTIS HC A07/MF A01 CSCL 10A

Various candidate rotor systems were compared in an effort to select a modern four-bladed rotor for the RSRA. The YAH-64 rotor system was chosen as the candidate rotor system for further development for the RSRA. The process used to select the rotor system, studies conducted to mate the rotor with the RSRA and provide parametric variability, and the development plan which would be used to implement these studies are presented. Drawings are included. A.R.H.

N82-16046*# Texas A&M Univ., College Station. Dept. of Aerospace Engineering.
SUMMARY OF THEORETICAL CONSIDERATIONS AND WIND TUNNEL TESTS OF AN AERODYNAMIC SPOILER FOR STALL PROOFING A GENERAL AVIATION AIRPLANE
Howard L. Chevalier Jan. 1982 55 p refs
(Grant NsG-1407)
(NASA-CR-165100) Avail: NTIS HC A04/MF A01 CSCL 01A

An airplane stall proofing system utilizing a spoiler was investigated for application on a low wing airplane representative of typical general aviation aircraft. Tests of the full scale airplane were conducted in the NASA Langley 30 x 60 foot full scale wind tunnel. The test velocity was 86 feet per second, corresponding to a Reynolds number of 2.20 million. The stall proofing capability of the spoiler is shown and a theoretical approach to the design of the spoiler and analysis of the spoiler's contribution to the airplane's trim and longitudinal stability is verified. Controlled spoiler deployment in a narrow angle of attack range, 4 degrees, immediately preceding the stall angle will stall proof the airplane. The results also show some of the limitations of flight tests to determine spoiler deployment rate for good handling qualities. M.G.

N82-16049*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPLICATION OF IMAGE PROCESSING TECHNIQUES TO FLUID FLOW DATA ANALYSIS
Charles C. Giamati 1981 16 p Presented at the 11th Ann. Computer Output Microfilm (COMtec) Conf., Lincolnshire, Ill., 24-26 Feb. 1981
(NASA-TM-82760; E-1081) Avail: NTIS HC A02/MF A01 CSCL 01A

The application of color coding techniques used in processing remote sensing imagery to analyze and display fluid flow data is discussed. A minicomputer based color film recording and color CRT display system is described. High quality, high resolution images of two-dimensional data are produced on the film recorder. Three dimensional data, in large volume, are used to generate color motion pictures in which time is used to represent the third dimension. Several applications and examples are presented. System hardware and software is described. M.G.

N82-16050# National Aerospace Lab., Tokyo (Japan).
SOME EXPERIMENTAL INVESTIGATIONS ON TRANSONIC FLUTTER CHARACTERISTICS OF THIN PLATE WING MODELS WITH SWEPTBACK AND TAPERED TIPS
Eiichi Nakai Sep. 1981 49 p refs In JAPANESE; ENGLISH summary
(NAL-TR-682; ISSN-0389-4010) Avail: NTIS HC A03/MF A01

Some experimental investigations on the transonic flutter characteristics were conducted using thin plate cantilevered wing models with sweptback tapered tips, which were elastically supported at the root, in the NAL 0.6m x 0.6m transonic blowdown wind tunnel for flutter testing in the range of Mach numbers from 0.804 to 1.171. The wing models have the tip planform of sweptback angles of 35 degrees at the leading edge and 30 degrees at 1/4 chord line, and an aspect ratio of 1.017 and a taper ratio of 0.6. It is concluded that the flutter boundaries of the wing models have been obtained and the boundaries expressed by the 'experimental flutter speed coefficient' are characterized as having minimum values at around Mach number 1.0. It is also concluded that the considerable increase in the flutter instability area is caused by the decrease in the stiffness of the elastic support at the root of the model. Author

N82-16054# Federal Aviation Administration, Oklahoma City, Okla. Civil Aeromedical Inst.
THE PREVALENCE OF VISUAL DEFICIENCIES AMONG 1979 GENERAL AVIATION ACCIDENT AIRMEN
J. R. Dille and C. F. Booze, Jr. Jul. 1981 10 p refs
(AD-A106489; FAA-AM-81-14) Avail: NTIS HC A02/MF A01 CSCL 01/2

Analyses of the accident experience of pilots who were monocular, did not meet (even the liberal) vision standards, had color vision defects and no operational restrictions, or wore contact lenses, have shown higher-than-expected accident experience in previous studies. However, no causal role had been assigned by accident investigators and reexamination of the records failed to show any obvious pattern or relationship between the defects and the accidents. In the present study of 1979 accidents, the relatively small number of pilots with aphakia and artificial lens implants, as well as the total eye pathology population, had significantly higher accident rates, but the monocular pilots did not. Again, no causal role had been ascribed. Some associations are debatable, but there is no clear recurring problem. There are still unresolved questions about the consistent operational performance of monocular pilots, those who are not fully corrected to 20/20 distant visual acuity bilaterally, airmen with near vision deficiencies only who are not required to wear corrective glasses, those without fusion, and several with appreciable pathology who have 20/20 corrected central visual acuity but about whom we know very little concerning their dynamic, peripheral, depth or accommodative function. Author (GRA)

N82-16055# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
A GENERALIZED ESCAPE SYSTEM SIMULATION COMPUTER PROGRAM: A USER'S MANUAL Final Report
Louis A. DAulorio, Kathleen M. Breakey (Computer Sciences Corp., Huntington Valley, Pa.), Shirley W. Trimble (Computer Sciences Corp., Huntington Valley, Pa.), and Bruce Waldron (Computer Sciences Corp., Huntington Valley, Pa.) Aug. 1981 105 p
(Contract N62269-78-C-0191)
(AD-A106152; NADC-81224-60) Avail: NTIS HC A06/MF A01 CSCL 01/3

The Generalized Escape System Simulation Computer Program was developed to simulate the operation of various ejection seats.

an open, level field about 7 nautical miles east southeast of Madisonville, Texas. Witnesses heard a small explosion and saw the aircraft descend from a dark cloud; the wings and the empennage were not attached during the observed portion of the aircraft's descent. The pilot and the two passengers were killed. The aircraft was destroyed. The National Transportation Safety Board determines that the probable cause of the accident was a pilot induced airframe overload following loss of aircraft control which resulted in the structural breakup of the aircraft. The reason(s) for the loss of aircraft control could not be determined. Contributing to the loss of control was the pilot's lack of instrument proficiency in multiengine aircraft. R.J.F.

N82-17139# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
AIRCRAFT ICING AVOIDANCE AND PROTECTION
9 Sep. 1981 16 p
(PB82-108135; NTSB-SR-81-1) Avail: NTIS HC A02/MF A01 CSCL 01C

The problems of aircraft icing from the standpoint of icing statistics, the meteorological factors which cause icing, the certification of aircraft by the FAA for the flight into known icing conditions, and the forecasting of icing conditions are investigated. It is noted that icing accidents are a problem primarily for general aviation aircraft and that in addition to the accidental losses due to icing, there are significant operational losses due to inadequacies in the weather forecasting system. The problems revealed can be alleviated, but in order to do so new technology will have to be developed based upon a better understanding of ice formation and improvements in the quality of icing forecasts. GRA

N82-17142*# Analytical Mechanics Associates, Inc., Hampton, Va.
TERMINAL AREA AUTOMATIC NAVIGATION, GUIDANCE, AND CONTROL RESEARCH USING THE MICROWAVE LANDING SYSTEM (MLS). PART 2: RNAV/MLS TRANSITION PROBLEMS FOR AIRCRAFT Final Report
Samuel Pines Washington, D.C. NASA Jan. 1982 139 p refs
(Contract NAS1-15116)
(NASA-CR-3511; AMA-80-12-Pt-2) Avail: NTIS HC A07/MF A01 CSCL 17G

The problems in navigation and guidance encountered by aircraft in the initial transition period in changing from distance measuring equipment, VORTAC, and barometric instruments to the more precise microwave landing system data type navaids in the terminal area are investigated. The effects of the resulting discontinuities on the estimates of position and velocity for both optimal (Kalman type navigation schemes) and fixed gain (complimentary type) navigation filters, and the effects of the errors in cross track, track angle, and altitude on the guidance equation and control commands during the critical landing phase are discussed. A method is presented to remove the discontinuities from the navigation loop and to reconstruct an RNAV path designed to land the aircraft with minimal turns and altitude changes. B.W.

N82-17144# Mitre Corp., McLean, Va. Metrek Div.
REQUIREMENTS FOR INSTRUMENT APPROACHES TO CONVERGING RUNWAYS
L. C. Newman, W. J. Swedish, and T. N. Shimi Sep. 1981 116 p refs
(Contract DTFA01-81-C-10001)
(AD-A108075; MTR-81W230; FAA-EM-82-4) Avail: NTIS HC A06/MF A01 CSCL 01/2

This document discusses the technical issues relevant to converging approaches and examines the feasibility of conducting instrument approaches as a means of increasing airport capacity. The main considerations in the analysis were: runaway geometry; missed approach paths; and pilot acceptance. A safety analysis was conducted to determine requirements and control procedures to provide protection against: random lateral variation from the missed approach path; Heading blunder; and rare and unexpected events. Requirements for final and missed approach are presented as are strategies for applying these requirements to airports with a wide variety of converging runway geometries. Preliminary recommended procedures are presented for conducting independent instrument approaches to Category I minima. GRA

N82-17146# Systems Control, Inc., Palo Alto, Calif.
DIFFERENTIAL OMEGA SYSTEM DEVELOPMENT AND EVALUATION Final Report, 27 Aug. 1977 - 15 Aug. 1981
T. M. Watt, L. E. Abrams, and F. G. Karkalik Washington FAA Aug. 1981 105 p refs
(Contract DOT-FA75WA-3662)
(AD-A107857; FAARD-81-69) Avail: NTIS HC A06/MF A01 CSCL 17/7

This report describes a development and evaluation program for Differential Omega in general aviation. The program was a cooperative venture between the FAA and Transport Canada. SCT performed system design, program management, and flight test on behalf of the FAA. Tracor, Inc. provided modified Omega airborne receivers under subcontract to SCT. Flight tests took place in Alaska aboard a Convair 580 provided by the FAA. Monitor stations were located in Anchorage and at Deadhorse. The most definitive results were obtained from flight tests conducted in October 1980 and February 1981. Important results included: (a) data-link range varied from 44 nm to 198 nm, (b) random component of navigation error was 0.25 nm, 2-D RMS, (c) range decorrelation error was about 2 nm over a distance of 550 nm, (d) transient response of the system-following aircraft procedure turns was characterized by a positional overshoot of about 1.5 nm, followed by a monotonically decreasing error with a two-minute time constant. Recommendations are made for improving system performance. Author (GRA)

N82-17148# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
ACTIVE BEACON COLLISION AVOIDANCE LOGIC EVALUATION. VOLUME 2: COLLISION AVOIDANCE (BCAS) THREAT PHASE Final Report, Apr. 1979 - Jun. 1980
A. Adkins, J. Thomas, B. Billmann, and J. Windle Sep. 1981 59 p refs
(FAA Proj. 052-241-320)
(AD-A107805; FAA-CT-80-51-2-Vol-2; FAA-RD-80-125-2) Avail: NTIS HC A04/MF A01 CSCL 01/2

The purpose of this project was to evaluate and refine the April 1979 version of the Beacon Collision Avoidance System (BCAS) logic prior to Active BCAS prototype flight testing. The April 1979 version of the BCAS logic added changes to support multiple aircraft conflict resolution, Conflict Indicator Register (CIR) interfacing and new surveillance logic interfacing. The results of the first phase of the Active BCAS logic, evaluating the Air Traffic Control Radar Beacon System (ATCRBS) threat phase, identified several improvements that should be made to the BCAS logic. These improvements were incorporated into the logic prior to beginning the second phase, the BCAS equipped threat phase. The second phase was conducted from September to November 1979 and was designed to evaluate the BCAS performance against BCAS equipped threats. The results are presented in this report. Several logic improvements have been identified. These changes have been implemented in both the threat logic and the BCAS command coordination logic (CIR logic). In general, BCAS performance for equipped threats was not as sensitive to vertical rate tracker noise as in the ATCRBS threat case. Resolution performance has been improved through a reduction in undesirable BCAS alarms and by reducing excessive separation with the inclusion of a projected vertical miss distance (VMD) filter for equipped threats. A better method of selecting threat volume parameters has been incorporated. GRA

N82-17149# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
INVESTIGATION OF WILCOX MODEL 585B VERY HIGH FREQUENCY OMNIDIRECTIONAL RADIO RANGE (VOR) SYSTEM, PART 3 Final Report, Mar. 1980 - Feb. 1981
Wayne E. Bell Oct. 1981 53 p refs
(FAA Proj. 041-305-830)
(AD-A107855; FAA-CT-81-46; FAA-RD-81-52; ACT-100) Avail: NTIS HC A04/MF A01 CSCL 17/7

A three-part investigation of the Wilcox 585B Very High Frequency Omnidirectional Radio Range (VOR) System was conducted. In Part 1, the magnitude of the ground error was reduced by modification and suitable adjustment of antenna element lengths of the field detector. In Part 2, investigation developed an acceptable calibration procedure for system 30 hertz (Hz) modulation. Obtaining compatible 30 Hz modulation reading between aircraft (far-field) and edge of counterpoise (near-field) measurements was an additional requirement. In Part 3, tests resolved any discrepancies in the tuning adjustments prescribed by the manufacturer's equipment manuals. This report, which is the last in a series of three, contains an outline of the tests and procedures for setting the lengths of the adjustable field detector elements, a recommended procedure for obtaining compatible near-field and airborne 30 Hz modulation readings, and recommended changes to the manufacturer antenna tuning procedures in order that the system meet required operational tolerances. Author (GRA)

N82-17150# Air Navigation Services, Inc., Westerngrund (West Germany).
AERONAUTICAL INFORMATION DATA SUBSYSTEM (AIDS): A GROUND-BASED COMPONENT OF AIR NAVIGATION SERVICES SYSTEMS
Frank W. Fischer 1981 5 p Presented at 11th AIDS Symp., Cologne, 22-24 Sep. 1981 Sponsored by DFVLR
Avail: NTIS HC A02/MF A01

The construction of an air navigation services information data base for internal and external use (airspace users before and during flight) of internally and externally produced information data is advocated. A data bank, which holds all current operational information data, controls the data switching and processing machine which constitutes the data communication subsystem. Benefits of AIDS include costs in data compiling and the provision of precise data for air traffic control, flight planning or rescue operations. Apart from the airlines, AIDS is of most use to general aviation operators. Author (ESA)

N82-17151*# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
USE OF OPTIMIZATION TO PREDICT THE EFFECT OF SELECTED PARAMETERS ON COMMUTER AIRCRAFT PERFORMANCE Progress Report
Valana L. Wells and Richard S. Shevell Feb. 1982 45 p refs
(Grant NAG1-202)
(NASA-CR-168439) Avail: NTIS HC A03/MF A01 CSCL 01C

The relationships between field length and cruise speed and aircraft direct operating cost were determined. A gradient optimizing computer program was developed to minimize direct operating cost (DOC) as a function of airplane geometry. In this way, the best airplane operating under one set of constraints can be compared with the best operating under another. A constant 30-passenger fuselage and rubberized engines based on the General Electric CT-7 were used as a baseline. All aircraft had to have a 600 nautical mile maximum range and were designed to FAR part 25 structural integrity and climb gradient regulations. Direct operating cost was minimized for a typical design mission of 150 nautical miles. For purposes of C sub L sub max calculation, all aircraft had double-slotted flaps but with no Fowler action. T.M.

N82-17152*# Goodyear Aerospace Corp., Akron, Ohio.
PRELIMINARY DESIGN STUDY OF A HYBRID AIRSHIP FOR FLIGHT RESEARCH
Ronald G. E. Browning Jul. 1981 286 p refs
(Contract NAS2-10777)
(NASA-CR-166246; GER-17016) Avail: NTIS HC A13/MF A01 CSCL 01C

The feasibility of using components from four small helicopters and an airship envelope as the basis for a quad-rotor research aircraft was studied. Preliminary investigations included a review of candidate hardware and various combinations of rotor craft/airship configurations. A selected vehicle was analyzed to assess its structural and performance characteristics. Author

N82-17153*# Lockheed-California Co., Burbank.
SYSTEMS STUDY OF TRANSPORT AIRCRAFT INCORPORATING ADVANCED ALUMINUM ALLOYS Final Report
I. Frank Sakata Jan. 1982 187 p refs
(Contract NAS1-16434)
(NASA-CR-165820; LR-29984) Avail: NTIS HC A09/MF A01 CSCL 01C

A study was performed to quantify the potential benefits of utilizing advanced aluminum alloys in commercial transport aircraft and to define the effort necessary to develop fully the alloys to a viable commercial production capability. The comprehensive investigation (1) established realistic advanced aluminum alloy property goals to maximize aircraft systems effectiveness (2) identified performance and economic benefits of incorporating the advanced alloy in future advanced technology commercial aircraft designs (3) provided a recommended plan for development and integration of the alloys into commercial aircraft production (4) provided an indication of the timing and investigation required by the metal producing industry to support the projected market and (5) evaluate application of advanced aluminum alloys to other aerospace and transit systems as a secondary objective. The results of the investigation provided a roadmap and identified key issues requiring attention in an advanced aluminum alloy and applications technology development program. Author

N82-17154* Textron Bell Helicopter, Fort Worth, Tex.
CORRELATING MEASURED AND PREDICTED INPLANE STABILITY CHARACTERISTICS FOR AN ADVANCED BEARINGLESS ROTOR Final Report
William H. Weiler Jan. 1982 72 p refs
(Contract NAS2-10772)
(NASA-CR-166280; Rept-699-099-046) Avail: NTIS HC A04/MF A01 CSCL 01C

The experimental data were obtained from hover tests for a scaled model of an advanced bearingless main rotor. Both isolated rotor and ground resonance conditions were tested. Test parameters included blade built-in cone and sweep angles, rotor inplane structural damping, pitch link location and fuselage structural damping. Analytical results for the conditions tested were obtained using current Bell Helicopter analyses. In addition, variations in the analytical models were made to assess their impact on the correlation between computed and measured results. Results are presented in tabular and graphical form. T.M.

N82-17155# Arinc Research Corp., Santa Ana, Calif.
TECHNOLOGY OVERVIEW FOR ADVANCED AIRCRAFT ARMAMENT SYSTEM PROGRAM
H. Rosenberg, R. Brooks, J. Alderman, K. Braman, G. OBryan, and G. Wright May 1981 284 p refs
(Contract N60530-80-C-0270)
(AD-A107680; Rept-1789-01-1-2406) Avail: NTIS HC A13/MF A01 CSCL 01/3

Presented herein are overviews of state-of-the-art technologies applicable to the Stores Management System and Suspension and Release Equipment of the Advanced Aircraft Armament System. Technology briefs are presented for selected areas, and references are made to detailed sources of desired information. Author (GRA)

N82-17156# Arinc Research Corp., Santa Ana, Calif.
STANDARDIZATION STUDY FOR ADVANCED AIRCRAFT ARMAMENT SYSTEM PROGRAM
Larry J. Graham and William G. Schulz May 1981 103 p refs
(Contract N60530-80-C-0339)
(AD-A107681; Rept-1783-01-1-2405) Avail: NTIS HC A06/MF A01 CSCL 01/3

Results of a 6-month study of standardization criteria and characteristics are presented that may be effectively applied to the Advanced Aircraft Armament System (AAAS) Program. System elements feasibly for standardization are identified. Standardization characteristics for those feasible elements are developed for various levels of standardization (subsystem, module, piece part) and standardization approaches (horizontal, vertical, area, functional, logistical, and cooperative). Alternative standardization characteristics are also postulated and recommendations are formulated for application to the AAAS Program. Author (GRA)

N82-17157# Hochschule der Bundeswehr, Munich (West Germany). Fachbereich Luft- und Raumfahrttechnik.
OPTIMAL DOLPHIN HANG GLIDER FLIGHT [OPTIMALER DELPHIN-SEGELFLUG]
E. D. Dickmanns Mar. 1981 71 p refs In GERMAN
Avail: NTIS HC A04/MF A01

Time minimal gliding flight in vertical air currents is discussed. If the vertical current wavelength is large as opposed to the trajectory oscillation taken by an airplane, an optimal flight with approximately n sub z = 1 can be obtained. In short vertical currents the dynamic warming up maneuver in the downwind gives great advantages. During the transition local conditions may interfere. Two fundamentally different control maneuvers of equal value to the sail functions are described. Transl. by E.A.K.

N82-17158# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.
THE ARMED HELICOPTER IN AIR TO AIR MISSIONS
Emil Weiland 1981 18 p Presented at Royal Aeronautical Soc. Rotorcraft Section Symp., London, 4 Feb. 1981
(MBB-UD-317-81-O) Avail: NTIS HC A02/MF A01

The antihelicopter-helicopter must be superior in performance and agility. The basic vehicle must be supplemented by a specialized armament demonstrating a combination of guns and fire and forget air to air missiles. In order to ensure a system superior to the possible enemy gunship, the helicopter needs to

HC A04/MF A01 CSCL 14/2

The design and development of a high durability, intermediate service temperature (< or = 600 F), direct reading transducer for the measurement of aerodynamic heating in the continuous wind tunnels of the von Karman Gas Dynamics Facility is described. This transducer operates on the axial temperature gradient or Schmidt-Boelter measurement concept. Considerable emphasis is placed upon the practical use of finite-element, two-dimensional heat conduction code for analysis of gage behavior rather than the indiscriminate use of invalid exact mathematical solutions. Laboratory evaluation and calibration of prototype transducers at ambient temperature levels varying from 70 to 500 F are discussed. Results of wind tunnel aerodynamic heating measurements using limited numbers of prototype Schmidt-Boelter gages are presented. Recommendations for future work efforts with regard to further development and testing of this measurement concept are discussed. Author (GRA)

N82-17513 British Aerospace Aircraft Group, Warton (England). Materials and Development Dept.

THE ULTRASONIC INSPECTION OF C.F.C.

R Wilson 7 Jul. 1981 12 p

(MDR-0465) Avail: Issuing Activity

Four carbon fiber composite sine wave spars, produced using various manufacturing techniques, were inspected ultrasonically. Procedures used for examining the web and the flanges are described. A quality representative test piece must be produced containing artificial defects of a known size in order to further NDI development work on these spars. A.R.H.

N82-17597# Southwest Research Inst., San Antonio, Tex. Dept. of Mining Technology

STUDY OF AIR COMPRESSOR HAZARDS IN UNDERGROUND AND SURFACE MINES Open File Report, Nov. 1979 - Jan. 1981

Martin B. Treuhaft and B. Chope Dial Jan. 1981 93 p refs

(Contract DI-BM-JO-10006)

(PB82-105164; BM-OFR-122-81) Avail: NTIS HC A05/MF A01 CSCL 08I

Air compressor hazards in mines are analyzed and guidelines for eliminating fires, explosions, and their operational hazards that can result when compressors are used in coal and metal nonmetal mining applications are presented. Government data bases and reports for mine accident are reviewed and examined. Foreign and domestic standards, regulations, and codes governing air compressor usage are discussed and compared industry trends toward air compressor usage are considered and their impact on compressor safety is analyzed. Recommendations are directed toward MSHA, mine management, and the Bureau of Mines regarding their involvement in accident reporting and prevention. GRA

N82-17638# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.

ROTOR MODEL FOR THE VERIFICATION OF COMPUTATIONAL METHODS Final Report

J. H. Argyris, W. Aicher, F. Karl, W. Kuemmerle, and M. Mueller 1980 66 p refs Sponsored in cooperation with International Energy Agency

(Contract BMFT-ET-4086-A)

(ISD-275; ISSN-0170-6071) Avail: NTIS HC A04/MF A01

A windmill rotor model with 7.3 m rotor diameter was constructed in order to test a data acquisition/transmission system and computational models. Data, e.g., strains, angles, linear movements, accelerations, are measured at the rotor, digitized, and transmitted optoelectronically. Measurements of rotor blade dynamic response to cyclic gravity loading are compared with theoretical values. Deviation between measurements and calculations is 11%. Author (ESA)

N82-17639# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.

STATIC INVESTIGATIONS OF ROTOR BLADES UNDER DEADWEIGHT AND DURING STATIONARY OPERATION Final Report

J. H. Argyris, K. A. Braun, and B. Kirchgaessner 1980 62 p refs Transl. into ENGLISH of "Statische untersuch. von rotorblaettern unter eigengewicht und im stationaeren betrieb" Rept. ISD-243 Stuttgart Univ., Stuttgart, 1979 57 p Original report in GERMAN previously announced as N82-17639 Sponsored in cooperation with International Energy Agency

(Contract BMFT-ET-4086-A)

(ISD-269; ISD-243; ISSN-0170-6071) Avail: NTIS HC A04/MF A01

Several rotorblades of a horizontal axis windmill are studied both nonoperating under deadweight, and under quasi-stationary loading with constant forces at rated operation, the blades of which have flap and lead-lag freedom as well as flap-pitch coupling. With a suitable mass distribution it is possible to reduce the blade bending moments in the flap direction drastically. The use of aircraft construction materials is considered. Carbon fiber reinforced plastic is the most suitable. Most of the blade models are investigated without lag hinge. The coning angle of rated operation assumed for the layout is reduced considerably for the blade models with lead-lag freedom in order to obtain sufficient centrifugal stiffness in the lag direction. Author (ESA)

N82-17640# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.

STABILITY AND RESPONSE TO GRAVITY OF THE FLAP LAG MOTION FOR A RIGID ROTOR BLADE WITH FLAP-PITCH COUPLING Final Report

J. H. Argyris and B. Kirchgaessner 1980 59 p refs Transl. into ENGLISH of "Stabilitaet und schwerkraftresponse der schlag-schwenkbewegung eines starren rotorblattes mit blattwinkelrueckstеuerung" Rept. ISD-244 Stuttgart Univ., Stuttgart, 1979 80 p Original report in GERMAN announced as N80-30949 Sponsored in cooperation with International Energy Agency

(Contract BMFT-ET-4086-A)

(ISD-270; ISD-244; ISSN-0170-6071) Avail: NTIS HC A04/MF A01

The coupled flap lag motion of a single, rigid rotor blade of a wind energy converter with flap and lag hinges and a coupling of the angle of attack with the flap motion is investigated. The equations of motion are developed under the assumption of linearized quasi-stationary aerodynamic forces. Static and dynamic stability of the coupled flap and lag motion are investigated. The equations are integrated for different cases under cyclic gravitational forces in order to estimate the importance of nonlinear terms and of the error resulting from the linearization of the conservative system. The nonlinear terms can be neglected, as can the effects of cyclic stiffness resulting from gravitational force. Results for nonlinearities arising from aerodynamic forces are inconclusive. Author (ESA)

N82-17641# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.

DYNAMIC ANALYSIS OF A ROTOR BLADE WITH FLAP AND LAG FREEDOM AND FLAP-PITCH COUPLING Final Report

J. H. Argyris, K. A. Braun, and B. Kirchgaessner 1980 103 p refs Transl. into ENGLISH of "Dyn. anal. eines rotorblattes mit schlagfreiheit, schwenkreiheit u. blattwinkelrueckstеuerung" Rept. ISD-258 Stuttgart Univ., Stuttgart, 1979 95 p Original report in GERMAN previously announced as N80-30950 Sponsored in cooperation with International Energy Agency

(Contract BMFT-ET-4086-A)

(ISD-271; ISD-258; ISSN-0170-6071) Avail: NTIS HC A06/MF A01

For a windmill rotor blade, a linearized system of differential equations of motion is developed, using a finite element idealization of linearized quasi-stationary aerodynamic forces. Constant rotational speed and a rigidly supported hub are assumed. For two rotor blade models, which differ only in their stiffness in lag direction, the complex eigenfrequencies are calculated. The dynamic response of the rotor blades is computed for cyclic gravity loads at rated operation, for a gust, and, in one case, for the tower wake. From the deformation of the structure the stresses at selected points along the blade are calculated. Torque and rotor thrust are determined for one model. Additional stiffness improves stability and lead-lag angles. The coning angle is excellently stabilized by the flap-pitch coupling. Author (ESA)

N82-17642# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.

STATIC AND DYNAMIC INVESTIGATIONS FOR THE MODEL OF A WIND ROTOR Final Report

J. H. Argyris, K. A. Braun, B. Kirchgaessner, and R. Walther 1980 71 p refs Transl. into ENGLISH of "Statische und dyn. untersuch. and einem windrotormodell" Rept. ISD-259 Stuttgart Univ., Stuttgart, Jun. 1979 69 p Original report in GERMAN

previously announced as N81-12626 Sponsored in cooperation with International Energy Agency
(Contract BMFT-ET-4086-A)
(ISD-272; ISD-259; ISSN-0170-6071) Avail: NTIS HC A04/MF A01

A wind rotor was constructed in order to test a data acquisition/transfer system which collects experimental data from the operating model and displays it on a screen. The comparison between the experimental data and the model results is used to check the applied computation methods. The static and dynamic analyses of the rotor model are considered. An 11% difference between experimental and model results is shown. A response problem with variable stiffness in time which arose during the dynamic analysis is solved by setting the structural stiffness constant over small time intervals, diagonalizing the time interval considered and integrating. After integration the solutions of the generalized degrees of freedom are transformed back into the physical system, using the time interval eigenvectors.
Author (ESA)

N82-17843# Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik.
LOADING CYCLES AND MATERIAL DATA FOR THE LAYOUT OF A WIND TURBINE OF SPECIAL HUB CONCEPT Final Report
J. H. Argyris and K. A. Braun 1980 38 p refs Transl. into ENGLISH of "Lastwechselzahlen und materialwerte fuer die auslegung einer windturbine spezieller nabenkonstruktion" Rept. ISD-260 Stuttgart Univ., Stuttgart, Jun. 1979 38 p Original report in GERMAN previously announced as N81-12627 Sponsored in cooperation with International Energy Agency
(Contract BMFT-ET-4086-A)
(ISD-273; ISD-260; ISSN-0170-6071) Avail: NTIS HC A03/MF A01

The number of loading cycles of a rotor blade was estimated in order to assess allowable blade stress. Fatigue strengths and allowable stresses are calculated for aeronautic construction materials. Using wind data, the number of starts and stops was estimated. With a guess for the number of revolutions necessary to reach stationary operation from standstill, the number of loading cycles was determined, using the blade aerodynamics. The number of operational hours gives the number of loading cycles for rated operation. Rotation speeds of 1.67 and 2 rad/sec are considered. For 1.67, the number of loading cycles during stationary operation = 2.06 x 10 to the 8th power; during starts and cut offs = 357,000. For 2 rad/sec, results are 2.47 x 10 to the 8th power and 463,000. Stress values, expressed in installed power/sqmm, are: aluminum alloy = 98; stainless steel = 294; glass fiber reinforced plastic = 98; and carbon fiber reinforced plastic = 147.
Author (ESA)

N82-17854*# Old Dominion Univ., Norfolk, Va. Dept. of Economics.
ENERGY ENVIRONMENT STUDY Final Report, 16 May 1980 - 15 Mar. 1981
Raymond Strangways Dec. 1981 123 p refs
(Contract NAG1-66)
(NASA-CR-168458) Avail: NTIS HC A06/MF A01 CSCL 13B

The international demand for and supply of oil between the years 1980 and 2000 is assessed and future world oil prices and their implications for the price of jet fuel are estimated. Three critical questions are investigated: (1) how long will the world supply of oil continue to keep pace with its demand under likely trends in its use and discovery; (2) at what price will demand and supply clear the world oil market; (3) what does the analysis imply about the price of jet fuel. Projection of oil price is based upon supply and demand, which is consistent with microeconomic analysis.
E.A.K.

N82-17865# Committee on Commerce, Science, and Transportation (U. S. Senate).
NOISE IMPACT ON COMMUNITIES FROM AIRCRAFT
Washington GPO 1981 40 p Hearing before the Comm. on Com., Sci., and Transportation, 97th Congr., 1st Sess., 10 Feb. 1981
(GPO-80-617) Avail: Committee on Commerce, Science, and Transportation

The environmental and noise pollution problems of Cannon International Airport in Reno, Nevada are discussed. Restrictions imposed by the Federal government and the airport management on flight into and out of the airport were reviewed. Near-by urban development projects are described and the impact of airport traffic on them was evaluated. Discussion focused on the balance of economic development brought about by the airport and the rights of residents to enjoy a comfortable environment.
T.M.

N82-17879*# Case Western Reserve Univ., Cleveland, Ohio.
INVESTIGATION AND EVALUATION OF A COMPUTER PROGRAM TO MINIMIZE THREE-DIMENSIONAL FLIGHT TIME TRACKS Final Report, 15 Sep. 1980 - 12 Aug. 1981
Frederic I. Parke 12 Aug. 1981 150 p
(Grant NAG3-101)
(NASA-CR-168419) Avail: NTIS HC A07/MF A01 CSCL 09B

The program for the DC 8-D3 flight planning was slightly modified for the three dimensional flight planning for DC 10 aircrafts. Several test runs of the modified program over the North Atlantic and North America were made for verifying the program. While geopotential height and temperature were used in a previous program as meteorological data, the modified program uses wind direction and speed and temperature received from the National Weather Service. A scanning program was written to collect required weather information from the raw data received in a packed decimal format. Two sets of weather data, the 12-hour forecast and 24-hour forecast based on 0000 GMT, are used for dynamic processes in testruns. In order to save computing time only the weather data of the North Atlantic and North America is previously stored in a PCF file and then scanned one by one.
R.J.F.

N82-17887# Ohio State Univ., Columbus. Computer Graphics Research Group.
TERRAIN MODEL ANIMATION Final Report, 1 Dec. 1979 - 15 Oct. 1980
John L. Booker, Charles Csuri, Robert Marshall, and Roger Wilson Sep. 1981 48 p
(Contract N61339-80-C-0008)
(AD-A107911; NAVTRAEQUIPC-80-C-0008-1) Avail: NTIS HC A03/MF A01 CSCL 09/2

Procedure models are used to combine fundamental data elements in the creation of unified objects comprising the terrain model. A procedure model to generate trees of various species was implemented. Interactive techniques were developed to generate mountains. An analysis was made of the performance of a Z-buffer display algorithm. Test results are included in the report.
Author (GRA)

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required in conducting the initial admission tests for simulators and the required follow-up tests. Improvements in simulation are discussed which would make the simulator even more efficient. G.R.

A82-19272 # **Simulation of modern radar installations in full-mission flight and tactics simulators (Simulation moderner Radaranlagen in Full-Mission-Flug- und Taktiksimulatoren).** H. G. Werner (Messerschmitt-Bölkow-Blohm GmbH, Ottobrun, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-103.* 17 p. In German.

The correct use of the radar systems represents one of the most important functions of the crew of modern bomber aircraft. The simulation of radar display and radars signals for other systems comprises, therefore, an essential part of the work load of the simulators. Terrain profiles are produced with the aid of a digital terrain data base, taking into account suitable antenna models, and the aircraft parameters. The terrain profiles provide the basis for the derivation of the radar echo data. The main function of the Multi-Role Combat Aircraft (MRCA) radar simulation is the generation of a realistic radar display video signal for the Ground Mapping Radar (GMR) and the Terrain Following Radar (TFR). A description is provided of design and functions of the Digital Radar Land Mass Simulator (DRLMS) of the MRCA Operational Flight and Tactics Simulator (OFTS). G.R.

A82-19273 # **Training in the flight and tactics simulator of the Navy Flight Squadron 3 'Graf Zeppelin' (Ausbildung im Flug- und Taktiksimulator des Marinefliegergeschwader 3 'Graf Zeppelin').** J. Zielke. *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper 81-109.* 11 p. In German.

The squadron has 14 antisubmarine warfare aircraft of the type Breguet 1150. The aircraft represents a NATO development, which is also employed by the French, Dutch, and Italian navies. In tactical combat missions the aircraft is employed with a crew of twelve men. The considered training device has been designed for the simulation of antisubmarine warfare situations. The simulation operations are essentially related to tactical basic and advanced training of the crew, the testing of new tactical procedures, and a participation in the tactical combat training program. The use of the simulator made it possible to reduce substantially the time required for actual flight training. The employment of the simulator makes it feasible to represent realistic combat situations which can generally not be economically provided by other means. G.R.

A82-19274 # **Report covering experience obtained at the German Lufthansa with respect to training involving the use of flight simulators (Erfahrungsbericht aus der Schulung mit Flugsimulatoren bei der Deutschen Lufthansa).** G. Wendt (Deutsche Lufthansa AG, Cologne, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, Paper.* 17 p. In German.

The use of flight simulators in the basic training of flight crews is steadily increasing. Basically, the reasons for this trend can be divided into three categories, which are related to aspects of safety, efficiency, and economics. Safety is probably the most important factor. The rate of accidents involving the death of persons was found to be nine times higher for training flights than for regular airline flights. Another advantage of training with a simulator is the possibility to provide many abnormal and emergency situations which, in connection with safety considerations, cannot be reproduced in an aircraft. A training involving the use of a simulator is consequently much more realistic and, therefore, more efficient than the training in an aircraft. Advantages of simulator training related to economics become increasingly important with rising fuel costs. G.R.

A82-19300 **Flexibility is offered by XV-15 tilt-rotor concept.** R. R. Ropelewski. *Aviation Week and Space Technology,* vol. 116, Jan. 11, 1982, p. 74-76, 78, 83, 85.

The flight profile flexibility, low pilot work load and relatively low noise and vibration levels for which the XV-15 tilt-rotor VLOL experimental aircraft was designed are confirmed by flight tests. The aircraft uses two three-blade, 25 ft diameter rotors powered by two 1550 shp turboshaft engines for both vertical lift and forward thrust, thereby combining rotary wing and fixed wing aircraft operational capabilities. Attention is given to the 'conversion corridor', or difference between wing stall speed and rotor overstress speed at any given angle of wingtip nacelle tilt angle. With a normal rate of nacelle conversion of 7.8 deg/sec, the nacelles can translate through the full 95 deg of rotation from horizontal to vertical flight in 12-13 sec. It is noted that the dual flight capability of the XV-15 has not called for the introduction of many new flight instruments into the cockpit. O.C.

A82-19305 * # **Analytical prediction of aerospace vehicle vibration environments.** J. F. Wilby and A. G. Piersol (Bolt Beranek and Newman, Inc., Canoga Park, CA). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-29.* 10 p. 11 refs. Members, $2.00; nonmembers, $4.00. Contracts No. NAS5-22832; No. NAS9-15231; No. NAS1-14611; No. NAS1-15426.

Considerable attention has been given recently to the formulation and validation of analytical models for the prediction of aerospace vehicle vibration response to acoustic and fluctuating pressures. This paper summarizes the development of such analytical models for two applications, (1) structural vibrations of the Space Shuttle orbiter vehicle due to broadband rocket noise and aerodynamic boundary layer turbulence, and (2) structural vibrations of general aviation aircraft due to discrete frequency propeller and reciprocating engine exhaust noise. In both cases, the spatial exterior excitations are convected pressure fields which are described on the basis of measured cross spectra (coherence and phase) information. Structural modal data are obtained from analytical predictions, and structural responses to appropriate excitation fields are calculated. The results are compared with test data, and the strengths and weaknesses of the analytical models are assessed. (Author)

A82-19306 # **Modal analysis using helicopter dynamic test data.** N. Giansante (Kaman Aerospace Corp., Bloomfield, CT) and N. Calapodas (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-30.* 9 p. Members, $2.00; nonmembers, $4.00. Army-supported research.

A description is presented of experimental techniques for dynamic test data acquisition and analytical procedures for performing modal analysis. Modal analysis was applied to data acquired from dynamic test of the AH-IG helicopter airframe. Application of the methodology allowed accurate definition of the structure's natural frequencies, generalized modal parameters and complex mode shapes. The AH-IG airframe exhibits complex modes because of the nonproportional distribution of damping resulting from elastomeric isolators and nonstructural access panels on the helicopter. Underlying the technique of modal testing is the principle of the linear decomposition of structural dynamic response into contributions from the natural modes occuring within a specified frequency interval. A measure of the success of a modal analysis technique is the ability to duplicate analytically the measured frequency response data for a given frequency range using the modal parameters extracted from the dynamic test results. In the subject program the dynamic response of the AH-IG was accurately synthesized over a continuous frequency interval attesting to the success both of the experimental and analytical techniques utilized. (Author)

A82-19307 # **Dynamic response of blades and vanes to wakes in axial turbomachinery.** R. N. Tadros and M. Botman (Pratt and Whitney Aircraft of Canada, Ltd., Longueil, Quebec, Canada). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-33.* 8 p. 17 refs. Members, $2.00; nonmembers, $4.00.

A numerical method is presented which allows the calculation of vibratory stresses in blades and vanes of axial turbines and compressors. The viscous wakes of the cascaded stages are defined by means of thin airfoil theory. The flow is incompressible and the cascades have low solidity. The attention is confined to the case of a single stator row upstream of a single blade row. An existing beam-type program is used to calculate structural natural frequencies and modal shapes. Structural and aerodynamic quantities are combined in a Lagrangian formulation in terms of generalized coordinates. The solution of the equations of motion results in generalized displacements and vibratory stresses. Theoretical results for a compressor turbine blade show the effects of some design parameters on the blade vibratory response. The vibratory stress obtained in a strain gauge test indicates a reasonable agreement. (Author)

A82-19310 # **Balancing of flexible rotors by the complex modal method.** S. Saito and T. Azuma (Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-46.* 7 p. 22 refs. Members, $2.00; nonmembers, $4.00.

A new calculation method of the modal unbalance response for general flexible rotors in fluid film bearings has been developed by introducing the concept of modal exciting force vector into the usual complex modal method, and the physical meaning of the damping ratio at a critical speed is discussed. Next, application of this method, that correction weights can be determined in only one trial operation, is reported, and positions to measure vibration and to correct unbalance weight are discussed on the basis of the right eigenvector and the exciting factor mode, respectively. Lastly, it is shown by experiments that the proposed balancing method is of use for actual rotors. (Author)

A82-19311 # **Application of the principle of reciprocity to flexible rotor balancing.** M. S. Darlow and A. J. Smalley (Southwest Research Institute, San Antonio, TX). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-49.* 5 p. 7 refs. Members, $2.00; nonmembers, $4.00. Research sponsored by the Mechanical Technology, Inc.

A series of numerical and experimental studies have been conducted to investigate the validity of the principle of reciprocity for real rotordynamic systems in the presence of damping, gyroscopic, and cross-coupling bearing effects. All of the results are found to be consistent with the principle of reciprocity. It is pointed out that by using the principle of reciprocity it is possible to substantially reduce the number of trial mass runs required for influence coefficient balancing or for the unified balancing approach, a recently developed procedure for balancing flexible rotors. V.L.

A82-19314 # **Optimum journal bearing parameters for minimum rotor unbalance response in synchronous whirl.** R. B. Bhat, T. S. Sankar (Concordia University, Montreal, Canada), and J. S. Rao. *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-55.* 6 p. 12 refs. Members, $2.00; nonmembers, $4.00. Natural Sciences and Engineering Research Council of Canada Grant No. A-7104.

The unbalance response of a Jeffcott-type rotor is analyzed with reference to the contributions of hydrodynamic bearing parameters including the bearing diameter, clearance, and the oil viscosity. Optimization of the bearing parameters is carried out using the method of feasible directions. It is shown that by using a four-shoe tilting pad type bearing with a L/D of 0.5, the maximum unbalance response of the original rotor studied can be reduced by 55%. V.L.

A82-19326 # **Development of a correlated finite element dynamic model of a complete aero engine.** R. A. Bellamy, J. C. Bennett, and S. T. Elston (Rolls-Royce, Ltd., Derby, England). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-74.* 8 p. 5 refs. Members, $2.00; nonmembers, $4.00.

This paper presents a particular case study in which a complete RB 211-524 engine carcass and nacelle was modelled using the Rolls-Royce finite element system. This structure was also vibration tested in the laboratory using two independent modal analysis systems. Close correlation between theory and experiment is demonstrated, which gives confidence in the finite element method for prediction of the dynamic properties of a real engineering structure. It also demonstrates that commercial modal analysis systems can measure the dynamic characteristics of such structures with sufficient quality to validate the theoretical models. (Author)

A82-19332 # **Prediction of aircraft interior noise using the statistical energy analysis method.** V. R. Miller (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and L. L. Faulkner (Battelle-Columbus Laboratories, Columbus, OH). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-102.* 9 p. 18 refs. Members, $2.00; nonmembers, $4.00.

An analytical model is developed to predict the transmission of noise into an airplane interior through the fuselage sidewall by the statistical energy analysis (SEA) method. The fuselage structure is represented as a series of curved, isotropic plates, the isotropic representation resulting from the effects of smearing out the stiffeners. Other complicating effects such as pressurization, acoustic transmission through windows or seal leaks, and aerodynamic excitation are excluded in this effort but could be modeled by these same methods. Evaluation of the model was made using measured full scale acoustic data from both an adhesively bonded and a mechanically fastened airplane fuselage structure. Reasonably good agreement was obtained between predicted and measured levels in the higher frequencies. Predicted levels were shown to be sensitive to the value chosen for structural loss factor. Comparisons were also made with the measured data with an estimation procedure reported in the literature. (Author)

A82-19333 # **A CAD/CAM graphics system with relative datums and tolerances.** J. P. Memery, W. R. Marler, and J. D. Lancaster (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-108.* 6 p. 10 refs. Members, $2.00; nonmembers, $4.00.

An interactive graphic design system for turned parts in use at Pratt & Whitney Aircraft is described. This CAD/CAM system is capable of capturing relative datums and tolerances required for the manufacture and inspection of these parts. Tolerance capacity allows application of the system to broaching, a process which is commonly used to produce the parts. In the CAD/CAM system, turned parts and bladed disk attachment cross-section profiles are created in the computer. The required position of the attachment root can be calculated to minimize moments created by centrifugal force and air loads on the airfoil. The leakage area between the blade root and the disk slot can be computed, and the weight of the finished part estimated. The computer description is stored in the CAD/CAM data base and identified on the engineering drawing. More than 20 design and manufacturing application modules are currently in place as part of the Pratt & Whitney Aircraft CAD/CAM system. J.F.

A82-19337 * # **Aeroelastic characteristics of a cascade of mistuned blades in subsonic and supersonic flows.** R. E. Kielb (NASA, Lewis Research Center, Structural Dynamics Section, Cleveland, OH) and K. R. V. Kaza (NASA, Lewis Research Center, Cleveland; Toledo, University, Toledo, OH). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-122.* 12 p. 19 refs. Members, $2.00; nonmembers, $4.00.

An investigation of the effects of mistuning on flutter and forced response of a cascade in subsonic and supersonic flows is presented. The aerodynamic and structural coupling between the bending and torsional motions and the aerodynamic coupling between the blades are included. It is shown that frequency mistuning always has a beneficial effect on flutter. Additionally, the results indicate that frequency mistuning may have either a beneficial or an adverse effect on forced response, depending on the engine order of the excitation and Mach number. (Author)

A82-19338 # **Natural frequencies of rotating bladed discs using clamped-free blade modes.** S. J. Wildheim (Stal-Laval Turbin AB, Finspang, Sweden). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-124.* 11 p. 16 refs. Members, $2.00; nonmembers, $4.00.

A method for calculating the natural frequencies of practical bladed disk assemblies is described, which is based on a dynamic substructuring technique. The out-of-plane vibrations of the rotating prestressed disk are described by receptances, while the blade

England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 31 p.

A description is presented of a small, non-rigid airship, which may be fueled by a combination of natural gas and liquid petroleum gas, intended to meet the territorial waters patrol requirements that have arisen through the imposition of a 200-mile economic zone around the islands of New Zealand. The non-metallic airship hull is suited for the installation of a 12-ft wide radar antenna, which will at an altitude of 4000 ft detect 11,000 sq ft targets at 100 n.mi. Attention is given to the structural design of the Kevlar-cloth hull, and to the management of thrust between a reciprocating powerplant for stationkeeping and two turboprop engines for 90-knot dash speeds. Performance projections are given for (1) combined weight of power units and fuel vs. range, (2) search capability vs. target area, (3) time on station at 40 knots and 4000 ft, (4) static stability, (5) speed as a percentage of engine power, and (6) lift derived from the hull at varying angles of attack and from the vectoring of the turboprop engines. O.C.

A82-20559 **Skyship 500 - The development of a modern production airship.** R. Munk (Airship Industries, Ltd., London, England). In: Airships and their maritime applications; Proceedings of the Symposium, London, England, March 10, 1981. London, Royal Aeronautical Society, 1981. 11 p.

A description is presented of the structure, systems, performance capabilities and possible missions of the Skyship 500 and 600 non-rigid airships. Hull envelope construction is unusual in that it combines a single-ply fabric with the use of longitudinal fabric panels in which the warp of the fabric also runs longitudinally rather than transversely, as has been the case traditionally. Collapsible ballonets are used fore and aft, and helium is employed as the lift gas. The gondola is constructed from Kevlar-reinforced epoxy, and incorporates vectorable ducted propellers driven by reciprocating engines on each side. A production-costs breakdown is given for all structural components and systems, and disposable-load figures under two assumed lift volumes are provided. The suitability of the craft is considered for maritime surveillance, ASW and mine sweeping roles. O.C.

A82-20560 **Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980.** Symposium sponsored by the Royal Aeronautical Society. London, Royal Aeronautical Society, 1981. 58 p.

Topics related to the design, maintenance, operability, and reliability of combat aircraft for the RAF are discussed. Specific attention is paid to front-line maintenance requirements, including the reduction of the numbers of necessary on-hand parts and the turnaround time. Management methods for reliability and maintenance are reviewed, as are particular aircraft design features which enhance operability, such as in the avionics systems. The interface between the procurement agencies, the manufacturers, the design teams, and the end users is explored, noting the effectiveness of contracts with specified reliability and MTBF requirements, and the techniques of producing combat-ready aircraft during peacetime conditions are outlined. M.S.K.

A82-20561 **Design for operability of military aircraft RAF engineering experience and requirements. I - Thoughts of a squadron engineer.** B. Robson (RAF, London, England). In: Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980. London, Royal Aeronautical Society, 1981. 5 p.

Factors which contribute to aircraft reliability are examined, with emphasis on first-line maintenance requirements. Mobility requirements are met by reducing the total amount of equipment that must be brought to the point of use, while on-board electronic systems checks, redundancy, and the ease of repairability are essential to reducing the amount of spares necessary on-hand. Reliability can be considered in terms of ease of repair external to combat damage, and resistance to foreign object damage, in addition to fault diagnosis procedures to save time in identifying defective components. Maintainability is discussed in terms of cost, manpower, time and equipment, and impinges on the efficiency of turnaround time. It is noted that the standardization of parts and tools have significantly aided the reduction of repair time for various aircraft. M.S.K.

A82-20562 # **Aircraft operability - RAF engineering experience and requirements. II.** D. Williams (RAF, London, England). In: Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980. London, Royal Aeronautical Society, 1981. 6 p.

The procurement cycle, engineering information, and day-to-day nominal operational procedures of combat aircraft maintenance are reviewed to form a basis for requirements for reliability and maintenance. The procurement cycle is outlined, with emphasis on development costs and production costs and timescales. Engineering data are gathered to predict the expected extent and time of repair of nominal breakdowns and operational damage. Specifications for MTBF are promulgated, and plans are defined for ground service testing, built-in test equipment, automatic test equipment, and all factors which consume time before readiness. All necessary components, times, and teams necessary to fulfill maintenance requirements are detailed, and definitions of reliability are set down. Emphasis is placed on tying reliability and maintenance requirements to contractual guarantees. M.S.K.

A82-20563 # **Aircraft design for operability.** H. A. G. Waugh (British Aerospace Public, Ltd., Co., Kingston-on-Thames, Surrey, England). In: Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980. London, Royal Aeronautical Society, 1981. 4 p.

The design of fighter aircraft is examined for modifications necessary in the design process to obtain maximum operability. Noting that aircraft are growing larger and requiring greater thrust, the tendency of organizations to resist change where change is needed is emphasized. Contractual guarantees for reliability and maintenance, performance standards, price, and fixed schedules created a perception of the necessity for changes to occur early in the design process. Changing standards in the middle of the design process also added to the workload and affected the level of understanding between the user and the manufacturer. Continued communications between the procurement agency, the end users, and the manufacturing team is stressed as necessary to achieving the cost, reliability and maintenance, and performance goals for new aircraft. M.S.K.

A82-20564 # **Operability of military aircraft - Avionic design aspects.** D. I. Jackson and G. Belcher (Marconi Avionics, Ltd., Rochester, Kent, England). In: Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980. London, Royal Aeronautical Society, 1981. 6 p.

The design, operability, reliability, and maintenance of avionics computers are discussed, with emphasis on ensuring availability in a combat environment. The characteristic accuracy and complexity of modern digital avionics systems are described in terms of an existing autopilot computer, a stability augmentation computer, and two separate display computers. The computers weigh from 25-38 lb, have from 1850-5000 components, draw from 120-180 W, and feature from 240-2800 internal and external connections, with MTBF ranging from 500-2000 hr. Cooling is accomplished through either cold wall or air blown methods, with the high density electronics mounted on module cards for ease of replacement and enhanced cooling. Increasing use of LSI expands the computing power, lowers the power requirements, and offers the potential for higher reliability. A schematic is provided of a reconfigurable system, and an impetus for standard computer languages is noted. M.S.K.

A82-20565 # **Operability of military aircraft - Some design and cost trends.** J. Fletcher and M. S. Wooding (British Aerospace Public, Ltd., Co., Warton Div., Preston, Lancs., England). In: Design for military aircraft operability; Proceedings of the Symposium, London, England, February 7, 1980. London, Royal Aeronautical Society, 1981. 10 p.

Trends, trade-offs, and variabilities in the maintainability, reliability, and survivability of combat aircraft in peacetime conditions are examined. The assurance of quality control before delivery is stressed, while changing components demands are noted to affect the economic continuity of small subcontractor investments in production equipment. A constant feedback is recommended between user operating experience, procurements demands, and designers to support the achievement of performance requirements and reliability, i.e. MTBF. Early, thorough testing of all new components are considered as essential before implementation in aircraft, although the up-front expense is greater. The choice of aircraft stores to minimize weight and size is discussed, along with the placement of arterial passageways to ensure survivability in the case of a strike by employing dispersed pathways and shielding. M.S.K.

A82-20570 **Modelling of target radar scattering with application to guidance simulation.** S. C. Woolcock (EMI Electronics, Ltd., Wells, Somerset, England). In: Trends in missile guidance design concepts; Proceedings of the Symposium, London, England, January 14, 1981. London, Royal Aeronautical Society, 1981. 30 p. 5 refs.

The complexity of the receivable scattering of radar signals from man-made targets is described, and the parameters which have the greatest influence on guidance are outlined. Target-phase fronts are complicated by multireflector scattering returning from complex surfaces, and angular glint occurs when the received return signal is imbedded in the field of several interference signals from reflective surfaces of the perceived target. Ground-based radars experience fluctuations due to polarization or frequency changes in the transmitted signal, range and aspect changes, environmental influences, and depolarization of scattering. Further discussion is devoted to air-to-air guidance systems radar problems, and features of reflective surfaces of typical targets are examined. Finally, the analytic modelling of underwater and guidance radars, as well as radar performance parameters, is presented, along with experimental techniques. M.S.K.

A82-20586 **MLS flare low elevation angle guidance considerations.** R. J. Kelly and E. F. C. LaBerge (Bendix Corp., Communications Div., Baltimore, MD). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 11.1.1-11.1.5. 6 refs.

Aircraft executing an automatic flare maneuever require vertical guidance information to the autopilot at very low altitudes just prior to touchdown. MLS provides the vertical guidance by combining, in the aircraft flare computer, flare elevation angle information with distance measured by DME to determine aircraft height above the runway. This paper addresses the system design considerations for the flare maneuver guidance, giving attention to accuracy requirements, error sources, antenna design considerations, the airborne signal processor, simulation studies, receiver bench tests, and field tests. Since MLS flare guidance accuracy requirements in the presence of ground multipath exceed that provided by the natural resolution of the scanning beam, it is demonstrated that, by using single edge processing and selected antenna height, a + or - 2-foot flare guidance accuracy can be achieved over the touchdown zone. B.J.

A82-20588 **Experimental measurement of the low angle terrain scattering interference environment.** J. E. Evans and D. F. Sun (MIT, Lexington, MA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 11.3.1-11.3.5. 17 refs. FAA-sponsored research.

The paper presents the results of an experimental study whose aim was to obtain a better quantitative understanding of low angle microwave propagation phenomena needed to assess the potential for improved elevation tracking performance. The experimental data were obtained with a 26-lambda L-band array and a 57-lambda C-band array at a variety of sites in eastern Massachusetts with vegetated and/or rolling terrain. The data were analyzed using the maximum likelihood and maximum entropy methods. It is found that these modern spectral estimation methods, especially the maximum entropy method, can be effectively used for ground reflection elevation multipath characterization. The angular spectra observed to date can be qualitatively and quantitatively predicted by a model based on specular reflections from tilted flat plates. B.J.

A82-20589 **Comparison of various elevation angle estimation techniques.** J. E. Evans and D. F. Sun (MIT, Lexington, MA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 11.4.1-11.4.5. 8 refs. FAA-sponsored research.

Distributions of multipath scattered power are used to compare several elevation angle estimation techniques: (1) conventional monopulse (CM); (2) off-boresight monopulse (OBM); (3) double null monopulse (DNM); (4) single edge processing (SEP) as used for flare processing in the MLS; and (5) a maximum entropy (ME) technique based estimator. The techniques were applied to several identical data sets, both synthetic and field measured. It is found that the ME technique appeared to yield the best performance if a sufficient number of sensor samples was available. The DNM and SEP appeared to work much better than the CM or OBM for the synthetic data cases. However, in the field measurement results, the DNM and OBM appeared to give similar performance and the SEP performed notably poorer than the other techniques. B.J.

A82-20590 **Tracking of low-altitude targets by a combined X/Ka-band radar system.** L. J. Klaver (Hollandse Signaalapparaten, Hengelo, Netherlands). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 11.5.1-11.5.5. 6 refs.

A historical account is given of how SIGNAAL arrived at a solution to the problem of tracking low-flying targets by a combined X/Ka-band radar system, while suppressing the image effect. In this system, target detection is performed by a normal search radar, and acquisition by the X-band tracking radar. With sufficient video quality, target tracking occurs in the Ka-band. B.J.

A82-20601 # **NAVSTAR global positioning systems.** J. Reynolds and T. McCabe (USAF, Space Div., Los Angeles Air Force Station, CA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 21.1.1-21.1.6.

A NAVSTAR system overview is presented. Consideration is then given to concept validation results, Phase I test results, full scale engineering development, test planning, Phase III production and deployment, and applications. B.J.

A82-20615 # **Laser communications via an atmospheric link.** R. S. Mason (USAF, Space Div., Los Angeles Air Force Station, CA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 27.1.1-27.1.9. 9 refs.

It is pointed out that interest in communications by laser over either an atmospheric or free space link has existed in the Air Force since the early 70's. The Laser Communications (LaserCom) program is currently in a test and demonstration phase. The Airborne Flight Test System (AFTS) developed in connection with LaserCom is discussed. The transmitter terminal is on board a modified C-135 aircraft. The receiver terminal is located on the ground. The demonstration range is up to 100 km in an altitude window of 33,000-37,000 ft. The airborne laser is a Nd:YAG which operates pulsed, mode-locked, and frequency doubled. The operating wavelength is 5320 A. Typical output power is 150 mW, linearly polarized. The pump source is a potassium arc-type lamp, driven at 250 W. The lamp is recognized as the limiting lifetime component of the system. G.R.

A82-20656 **Land navigation with a low cost GPS receiver.** K. P. Yiu, R. Eschenbach, and F. Lee (Hewlett-Packard Laboratories, Palo Alto, CA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 55.3.1-55.3.7. 5 refs.

The Navstar Global Positioning System (GPS) is a satellite-based

The program generates a three dimensional trajectory of the ejection seat and its occupant, and is intended to be used in the evaluation of ejection seat design and performance. The program is written in FORTRAN IV and is highly structured for ease of modification and updating. This report outlines the steps necessary to succesfully execute the program. Author (GRA)

N82-16056# Army Research and Technology Labs., Fort Eustis, Va. Applied Technology Lab.
TEST AND EVALUATION OF IMPROVED AIRCREW RESTRAINT SYSTEMS
G. T. Singley, III Sep. 1981 352 p refs
(DA Proj. 1L1-62209-AH-76)
(AD-A107576; USAAVRADCOM-TR-81-D-27) Avail: NTIS HC A16/MF A01 CSCL 01/3

US Army aviation accident data shows that a majority of all injuries in attack helicopters could have been avoided if these aircraft had been equipped with crashworthy seat and restraint systems. The compactness of the cockpit and the close proximity of mission equipment to the aircrew in attack and scout helicopters pose serious crash impact hazards. Although not desirable from a crashworthiness standpoint, operational considerations may dictate that mission equipment and structure be located within the occupant's crash impact motion envelope, particularly for his head. The cockpit can be delethalized further when the improved restraint is complemented by padding potential strike surfaces in the cockpit; making contact surfaces frangible; and providing weapon system sights with frangibility, telescoping, and/or swing-away features. This report presents the results of an effort to test and compare the potential of several aircrew restraint systems to reduce the crash impact motion envelope of helicopter aircrewmen. Author (GRA)

N82-16057# Department of Energy, Washington, D. C.
SYMPOSIUM ON COMMERCIAL-AVIATION ENERGY-CONSERVATION STRATEGIES
1981 373 p refs Proceedings of Symp. on Commercial Aviation Energy Conserv. Strategies, Washington, D.C., 2-3 Apr. 1981 Sponsored in part by FAA, Washington, D.C.
(DE81-028406; CONF-8104103) Avail: NTIS HC A16/MF A01

Energy conservation strategies applicable to commercial aviation are presented. General topics discussed include Federal and industry conservation programs such as flight operations, air traffic control, engineering and maintenance, and corporate management strategies. Included is a discussion of possible future actions. DOE

N82-16058# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
SPECIAL INVESTIGATION REPORT. SEARCH AND RESCUE PROCEDURES AND ARMING OF EMERGENCY LOCATOR TRANSMITTER: AIRCRAFT ACCIDENT NEAR MICHIGAN CITY, INDIANA, 7 DECEMBER, 1980
11 Aug. 1981 19 p
(PB81-249427; NTSB-SIR-81-2) Avail: NTIS HC A02/MF A01 CSCL 01B

A special investigation of the circumstances surrounding the crash of a Beechcraft E-90, near Michigan City, Indiana, on December 7, 1980 and of the search and rescue activities following the accident, and the associated operation of the aircraft's emergency locator transmitter (ELT) is presented. As a result of not following proper notification procedures, coordination oversights, and communicaton gaps, the search for the missing aircraft was significantly hampered. The actual crash site was not reached by search personnel until nearly 4 hours after the crash. Some or all of the aircraft's four occupants, who died of hypothermia, probably survived the original crash. Examination of the ELT switch revealed that it was in the OFF position. A rescue could have been effected if the proper authorities had been notified and given the aircraft's last known position. GRA

N82-16059* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPECTRALLY BALANCED CHROMATIC LANDING APPROACH LIGHTING SYSTEM Patent
Wendell D. Chase, inventor (to NASA) Issued 22 Sep. 1981 10 p Filed 10 Dec. 1976 Supersedes N77-12031 (15 - 03, p 0286)
(NASA-Case-ARC-10990-1; US-Patent-4,291,294;
US-Patent-Appl-SN-749420; US-Patent-Class-340-26;
US-Patent-Class-244-114R) Avail: US Patent and Trademark Office CSCL 17G

Red warning lights delineate the runway approach with additional blue lights juxtaposed with the red lights such that the red lights are chromatically balanced. The red/blue point light sources result in the phenomenon that the red lights appear in front of the blue lights with about one and one-half times the diameter of the blue. To a pilot observing these lights along a glide path, those red lights directly below appear to be nearer than the blue lights. For those lights farther away seen in perspective at oblique angles, the red lights appear to be in a position closer to the pilot and hence appear to be above the corresponding blue lights. This produces a very pronounced three dimensional effect referred to as chromostereopsis which provides valuable visual cues to enable the pilot to perceive his actual position above the ground and the actual distance to the runway. Official Gazette of the U.S. Patent and Trademark Office

N82-16060*# Analytical Mechanics Associates, Inc., Hampton, Va.
TERMINAL AREA AUTOMATIC NAVIGATION, GUIDANCE, AND CONTROL RESEARCH USING THE MICROWAVE LANDING SYSTEM (MLS). PART 3: A COMPARISON OF WAYPOINT GUIDANCE ALGORITHMS FOR RNAV/MLS TRANSITION Final Report
Samuel Pines Washington NASA Jan. 1982 87 p refs
(Contract NAS1-15116)
(NASA-CR-3512; AMA-81-7) Avail: NTIS HC A05/MF A01 CSCL 17G

The results of an investigation carried out for the Langley Research Center Terminal Configured Vehicle Program are presented. The investigation generated and compared three path update algorithms designed to provide smooth transition for an aircraft guidance system from DME, VORTAC, and barometric navaids to the more precise MLS by modifying the desired 3-D flight path. The first, called the Zero Cross Track, eliminates the discontinuity in cross track and altitude error by designating the first valid MLS aircraft position as the desired first waypoint, while retaining all subsequent waypoints. The discontinuity in track angle is left unaltered. The second, called the Tangent Path also eliminates the discontinuity in cross track and altitude and choose a new desired heading to be tangent to the next oncoming circular arc turn. The third, called the Continued Track eliminates the discontinuity in cross track, altitude and track angle by accepting the current MLS position and track angle as the desired ones and recomputes the location of the next waypoint. A method is presented for providing a waypoint guidance path reconstruction which treats turns of less than, and greater than, 180 degrees in a uniform manner to construct the desired path. Author

N82-16063# Lincoln Lab., Mass. Inst. of Tech., Lexington.
ATCRBS UPLINK ENVIRONMENT MEASUREMENT NEAR JACKSONVILLE, FLORIDA
F. Nagy, Jr. 25 Sep. 1981 124 p
(Contracts F19628-80-C-0002; DOT-FA72WAI-261; FAA Proj. 052-241-04)
(AD-A108053; ATC-94; FAA-RD-80-70) Avail: NTIS HC A06/MF A01 CSCL 17/7

Airborne measurements of the Air Traffic Control Radar Beacon System (ATCRBS) 1030 MHz uplink environment are described. Measurements were made using the AMF, a special purpose airborne sensor-recorder, during a 23 May 1979 flight in the greater Jacksonville, Florida area. The 2-way flight covered the 450 nm coastline between Fayetteville (NC) and Vero Beach (FL) first at 10,000 then at 25,000 feet. Data recorded at 61 locations have been analyzed to plot combined pulse, interrogation and suppression rates for all locations and individual rates, received powers and angles for 37 locations. Fifty-nine ground interrogators were detected and a list included serves as an all-interrogator/all location (59 x 37) visibility matrix. PRI/PRF distributions of interrogations received are shown at three selected measurement locations. A pulse-by-pulse plot of over 50 Mode 4 interrogations shows their effect on a typical transponder. A worst location is examined for peak instantaneous interrogation rates capable of causing transponder reply-rate limiting (RRL), desensitization and track loss. Durations and periods of recurrence of synchronous jamming for 23 near-equal scan periods are computed. Probabilities of multiple mainbeam coincidences (multi-PRF jamming) are also calculated. Airborne (AMF) and ground based (FAA En-route) coverages are compared, and reported operational problems (target splits, lost tracks, poor coverage) are addressed. Author

N82-16067# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
AIRCRAFT POSITION MEASUREMENT USING LASER BEACON OPTICS M.S. Thesis - Princeton Univ.
Steven G. Webb 1981 107 p refs
(AD-A107973; AFIT-CI-81-58T) Avail: NTIS HC A06/MF A01 CSCL 17/7

The development of a system to precisely measure the relative position between two aircraft in-flight utilizing a laser beacon, an optical detector array, and on-board microprocessing is examined. The laser beacon board, mounted on the helicopter, consists of two orthogonal fan-shaped narrow width beams, which rotate at a constant four revolutions per second and have fields of view approaching 166 degrees. The photodiode transmits the detected beams, as pulses, to an electronics system where they pass through a band-pass filter and are converted into digital pulses for signal processing. The laser pulses are detected in the presence of background solar interference through optical spectral filtering of the incident light and electronic filtering of the photodiode signal. Initial tests of the laser beacon and the detector optics have demonstrated the potential for their use as elements of a relative position measurement system. GRA

N82-16068*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPIN TESTS OF A SINGLE-ENGINE, HIGH-WING LIGHT AIRPLANE
Eric C. Stewart, William T. Suit, Thomas M. Moul, and Philip W. Brown Jan. 1982 93 p refs
(NASA-TP-1927; L-14305) Avail: NTIS HC A05/MF A01 CSCL 01C

The airplane has a relatively steep spin mode (low angle of attack) with a high load factor and high velocity. The airplane recovers almost immediately after any deviation from the prospin control positions, except for one maneuver with reduced flexibility in the elevator control system. T.M.

N82-16069*# Nielsen Engineering and Research, Inc., Mountain View, Calif.
INTEGRATION OF A CODE FOR AEROELASTIC DESIGN OF CONVENTIONAL AND COMPOSITE WINGS INTO ACSYNT, AN AIRCRAFT SYNTHESIS PROGRAM Final Report, 1972 - 1974
Joseph Mullen, Jr. Ames Research Center, Calif. NASA May 1976 143 p refs
(Contract NAS2-8558)
(NASA-CR-137805) Avail: NTIS HC A07/MF A01 CSCL 01C

A comparison of program estimates of wing weight, material distribution, structural loads and elastic deformations with actual Northrop F-5A/B data is presented. Correlation coefficients obtained using data from a number of existing aircraft were computed for use in vehicle synthesis to estimate wing weights. The modifications necessary to adapt the WADES code for use in the ACSYNT program are described. Basic program flow and overlay structure is outlined. An example of the convergence of the procedure in estimating wing weights during the synthesis of a vehicle to satisfy F-5 mission requirements is given. A description of inputs required for use of the WADES program is included. T.M.

N82-16070*# Lockheed-Georgia Co., Marietta.
TURBOPROP CARGO AIRCRAFT SYSTEMS STUDY
J. C. Muehlbauer, J. G. Hewell, Jr., S. P. Lindenbaum, C. C. Randall, N. Searle, and R. G. Stone, Jr. Nov. 1981 232 p refs
(Contract NAS1-15708)
(NASA-CR-165813; LG81ER0222) Avail: NTIS HC A11/MF A01 CSCL 01C

The effects of using advanced turboprop propulsion systems to reduce the fuel consumption and direct operating costs of cargo aircraft were studied, and the impact of these systems on aircraft noise and noise prints around a terminal area was determined. Parametric variations of aircraft and propeller characteristics were investigated to determine their effects on noiseprint areas, fuel consumption, and direct operating costs. From these results, three aircraft designs were selected and subjected to design refinements and sensitivity analyses. Three competitive turbofan aircraft were also defined from parametric studies to provide a basis for comparing the two types of propulsion. S.L.

N82-16071# Aeronautical Research Labs., Melbourne (Australia).
RESONANCE TESTS ON A PIPER PA-32R TAILPLANE BEFORE AND AFTER DAMAGE Technical Memo, Feb. - Jul. 1980
A. Goldman and B. Quinn Apr. 1981 16 p ref
(AD-A106273; ARL/STRUC-TM-328) Avail: NTIS HC A02/MF A01 CSCL 01/3

Investigations have been carried out, on the tailplane of a Piper PA-32R aircraft, to determine the effect of damage, in the form of a split in the underside skin, on the modes of vibration of the tailplane. Details and results of the investigations are described. Author (GRA)

N82-16072# Rockwell International Corp., El Segundo, Calif. Aircraft Div.
CONFIGURATION DEVELOPMENT SYSTEM/NAVAIR REPORT Final Report
Daniel Paul Raymer 26 May 1981 8 p
(Contract N00019-80-C-0489)
(AD-A106727; NA-81-290) Avail: NTIS HC A02/MF A01 CSCL 01/3

A fixed price level of effort was performed to install Rockwell's Configuration Development System (CDS) at the Naval Air Systems Command (NAVAIR) facility in Washington, D.C. (Crystal City). Installation of CDS permits NAVAIR the capability to conceptually design aircraft concepts on an interactive graphics terminal and also perform conceptual analysis and concept iteration. Under the contract, the CDS system was converted to run on a VAX 11-780 computer. Program modifications were implemented to allow a greater degree of device-independence, especially for terminal input/output. Also, the CDS program was tested and debugged, the command interpreter was improved, and some additional capabilities were developed. The manual was rewritten including the addition of training materials for classroom and hands-on instruction. Finally, the system was installed and users were trained. Author (GRA)

N82-16073# Aeronautical Research Labs., Melbourne (Australia).
GROUND CALIBRATION OF A STRAIN-GAUGED CT-4A AIRCRAFT (1979)
R. P. Carey and S. P. Costolloe Apr. 1981 53 p refs
(AD-A107847; ARL/SRUC-TM-330) Avail: NTIS HC A04/MF A01 CSCL 01/3

A strain gauged CT-4A aircraft was calibrated for external loadings as a supplement to flight testing. The loading has been described and the outputs from regression analyses on the strain/load data have been tabulated. Author (GRA)

N82-16074# Army Aviation Engineering Flight Activity, Edwards AFB, Calif.
ICE PHOBICS BLADE TRACKING AND COMPARISON OF VIBRATION ANALYSIS TECHNIQUES Final Report, Jun. 1979 - Mar. 1980
William Y. Abbott, Floyd I. Dominick, and Stuart Arthur May 1981 64 p refs
(AD-A108121; USAAEFA-79-86) Avail: NTIS HC A04/MF A01 CSCL 01/3

The United States Army Aviation Engineering Flight Activity conducted an evaluation of two vibration measuring devices, the Chadwick-Helmuth VIBREX and the Scientific-Atlanta Vibration Signature Recorder, as flight test instrumentation. During the course of those evaluations, it was determined that the Dow Corning E2460-40-1 (redesignated E2976-46) ice phobic coating applied to the rotor blades of a UH-1H helicopter, did not induce undesirable vibrations. It was also concluded that the VIBREX may be used as test instrumentation if the frequencies of interest are already known, and the Scientific-Atlanta device provides good 'quick look' spectral vibration data. Author (GRA)

N82-16075* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
SYSTEM FOR PROVIDING AN INTEGRATED DISPLAY OF INSTANTANEOUS INFORMATION RELATIVE TO AIRCRAFT ATTITUDE, HEADING, ALTITUDE, AND HORIZONTAL SITUATION Patent
Robert James, inventor (to NASA) (James and Associates, Lancaster, Calif.) Issued 11 Aug. 1981 19 p Filed 30 May 1979 Supersedes N79-24988 (17 - 16, p 2074) Sponsored by NASA
(NASA-Case-FRC-11005-1; US-Patent-4,283,705; US-Patent-Appl-SN-043942; US-Patent-Class-340-27NA;

be designed to take full advantage of the inherent performance and agility potential of the basic helicopter elements. The agility aspect of the rotorcraft inherent characteristics of the major rotorcraft components are discussed and a possibility for a practical solution is indicated. Author

N82-17160# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Structures and Materials Panel.
DESIGN MANUAL FOR IMPACT DAMAGE TOLERANT AIRCRAFT STRUCTURE
John G. Avery (Boeing Military Airplane Co., Seattle) Oct. 1981 230 p refs Sponsored in part by Dept. of Defense
(AGARD-AG-238; ISBN-92-835-1403-3) Avail: NTIS HC A11/MF A01

The structural design information is grouped into three major sections: description of projectile threats; analysis methods for predicting structural response to projectile impact; and design guidelines for impact tolerance. The hydrodynamic ram effect and aircraft engine disintegration are highlighted.

N82-17161# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
DESCRIPTION OF PROJECTILE THREATS
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 1-24 refs

Avail: NTIS HC A11/MF A01

Evaluating the degradation of aircraft structure resulting from projectile impact requires a knowledge of the threat and encounter conditions. This is necessary in understanding the failure mechanisms and structure response modes induced by the various types of threats. Projectile types, important encounter parameters, and typical terminal effects are discussed. Information that is helpful in understanding the analysis of structural response to impact and the design guidelines for impact damage tolerance is presented. T.M.

N82-17162# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ANALYSIS METHODS FOR PREDICTING STRUCTURAL RESPONSE TO PROJECTILE IMPACT
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 27-44

Avail: NTIS HC A11/MF A01

Analysis methods and data available for predicting the response of metal and fiber composite structure to projectile impact are presented. The analysis methods discussed are applicable to impacts from small arms projectiles, missile warhead fragments, and the fragmentation and blast effects of high-explosive projectiles. The responses addressed include penetration capability, damage size and type, strength degradation of damaged structure, and internal load redistribution. T.M.

N82-17163# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ANALYSIS METHODS FOR BALLISTIC DAMAGE SIZE AND TYPE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 45-78

Avail: NTIS HC A11/MF A01

The parameters which influence the size and character of projectile impact damage are described. Predicting damage size is the first step is assessing the structural capability of impacted structure, since damage size determines net section strength loss, stiffness loss, and the flaw size for failure analysis. The discussion is organized according to projectile type as follows: non-exploding projectiles; high explosive projectiles; and engine debris projectiles. Within each projectile category the responses of both metallic and fiber composite structure are discussed. The effects of fluid pressure in causing damage, a phenomenon known as hydrodynamic ram, are discussed. T.M.

N82-17164# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
DAMAGE FROM HIGH EXPLOSIVE (HE) PROJECTILES
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 79-135 refs

Avail: NTIS HC A11/MF A01

The structural damage done by HE projectiles (20- to 30-mm, for example) is the result of multiple fragment penetrations and internal blast pressures, acting separately and in combination. The fragments are created as the metal casing surrounding the explosive bursts due to the intense pressures generated by the detonation. Fragment damage degrades structural strength and stiffness, and blast pressures added to the existing flight loads can cause excessive deformations and element failures. The nature and extent of structural damage from HE projectile fragments and blast pressure depend upon these variables: material type and thickness; projectile size and delay characteristics; striking velocity and obliquity; distance from detonation to impacted structure (standoff); and internal volume of structural cell and extent of venting. The significance of each of these variables is discussed. Qualitative descriptions of HE projectile damage in metallic and fiber composite structure are presented followed by a discussion of damage prediction analysis techniques for blast and fragments. T.M.

N82-17165# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
DAMAGE FROM ENGINE DEBRIS PROJECTILES
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 136-139

Avail: NTIS HC A11/MF A01

The effects of uncontained projectile emanating from an engine and subsequently striking an adjacent portion of the airframe are assessed. The effects are treated the same as for effects resulting from nonexploding military projectiles. There is an important distinction, however, in that the engine debris projectile is typically an irregular fragment (as opposed to a bullet), behaving more like a warhead fragment or the fragments generated from a high-explosive projectile. T.M.

N82-17166# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HYDRODYNAMIC RAM DAMAGE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 140-152

Avail: NTIS HC A11/MF A01

Hydrodynamic ram is a phenomenon that may cause extensive structural failure of aircraft fuel cells when they are subiected to ballistic impact. During impact and penetration of the fuel cell, intense pressure waves are generated within the liquid by the projectile. The response of the fuel cell to this pressure loading varies according to its construction. For example, the walls of an integral fuel cell are formed by the aicraft skin, which is usually constructed of high-strength metal designed to withstand normal flight loads. This type of structure can fail catastrophically in response to hydrodynamic ram pressure loading due to fracturing of the walls of the cell. Self-sealing fuel cells can also be defeated due to hydrodynamic ram by gross tearing of the material or by misalignment of the wound edges, thereby defeating the self-sealing process. Both of these effects become increasingly severe as fuel cells become smaller, or projectile kinetic energies increase. An analysis method to predict hydrodynamic ram pressures generated by small arms ammunition was developed. The analysis method is based on the conversion of projectile kinetic energy to pressure field energy and includes the effects of reflections from the tank walls. T.M.

N82-17167# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
EFFECTS OF CYCLIC LOADING ON PROJECTILE IMPACT DAMAGE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 153-157

Avail: NTIS HC A11/MF A01

The cyclic loading induced during flight can influence the severity of existing impact damage by initiating fatigue cracks at the damage site, subsequent crack sharpening or blunting and crack growth. There can be significant time dependent changes in the residual strength of the structure due to these alterations in the size and character of the impact damage. Projectile produce a wide variety of damage types, including cracks, holes, tears, large determination, even totally severed structural elements. The response of the damaged structure when exposed to cyclic loads reflects this wide variety of structural damage. For example, the cyclic loading can result in immediate growth when the projectile damage is a crack. There may be, however, a time (number of cycles) devoted to crack nucleation. Several important aspects of the fatigue response of impact damaged structure are described in terms of crack initiation and extension. An approach which basically consists of assuming immediate fatigue crack initiation at the damage site, and then applying conventional crack growth analysis is suggested. T.M.

N82-17168# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
STIFFNESS DEGRADATION OF IMPACT DAMAGED STRUCTURE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 159-160

Avail: NTIS HC A11/MF A01

Stiffness reduction in impact damaged structural elements can be important from two standpoints. The first is the alteration of load distribution within the structure, potentially causing overloading and failure of undamaged elements. The second area of potential concern is the residual stiffness of major structural components, since stiffness degradation may lead to instability and control inadequacy. These two topics are discussed, however, there are few verified analysis methods for predicting stiffness degradation associated with ballistic damage. Both of these stiffness degradation effects, but particularly the latter, become increasingly significant as the extent of the inflicted damage becomes larger. Stiffness degradation may well be a problem for HE projectile impacts, but it is generally insignificant with small arms. T.M.

N82-17169# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
STRENGTH DEGRADATION OF IMPACT DAMAGED STRUCTURE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 161-194

Avail: NTIS HC A11/MF A01

Projectile damage destroys a portion of the load carrying capability of the structure, alters the distribution of internal loads, and introduces a flaw which may cause failure by locally disturbing the stress field. The latter effect is most significant with regard to the relatively small damage induced by small arms projectile and dispersed warhead or engine debris fragments. High explosive projectiles can often create damage of sufficient size to substantially degrade structural performance by all three effects. Estimating the residual strength of structure damaged by projectile impact is a major step in predicting structural capability. The analysis methods presented for evaluating strength capability are organized according to structural complexity: analysis of monolithic panels; analysis of multiple load path panels; and analysis of multielement structure. The application of conventional and modified fracture mechanics analysis to ballistic damaged panels is discussed. The extension of these approaches to the requirements of panels having discrete stiffening members are discussed. T.M.

N82-17170# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ANALYSIS OF MULTIPLE LOAD PATH PANELS CONTAINING IMPACT DAMAGE
In its Design Manual for Impact Damage Tolerant Aircraft Struct. Oct. 1981 p 195-209

Avail: NTIS HC A11/MF A01

Many structural configurations cannot be represented as monolithic panels in assessing strength degradation from impact damage. The wings of transport aircraft, for example, often consist of skin with riveted stiffeners. The stiffeners can provide damage containment or crack assessment capability that is not considered in element residual strength analysis. Since the crack arrestment capability can significantly improve the residual strength of damaged structure, the stiffening must be included in the analysis. The response of stiffened panels to projectile damage, and available analytical techniques for residual strength prediction, are discussed. T.M.

N82-17171# McDonnell Aircraft Co., St. Louis, Mo.
CORROSION CONTROL TEST METHOD FOR AVIONIC COMPONENTS Final Report, 27 Sep. 1979 - 27 May 1981
A. W. Morris 25 Sep. 1981 60 p refs
(AD-A105061; NADC-81174-60) Avail: NTIS HC A04/MF A01 CSCL 01/3

The program objective was to develop an accelerated laboratory corrosion test capable of simulating the severe corrosive effects of an aircraft carrier deployment environment. The current standard 5% salt fog test is not severe enough to simulate the carrier environment, thus limiting its usefulness in forecasting corrosion failures. To provide test standards, representative electrical and electronic units were exposed on an oil burning carrier during a 9 month tropical cruise and on a nuclear carrier during a 10 month tropical cruise. A series of laboratory tests were run to identify corrosion environments which provide good correlation with actual carrier results. The tests were also judged on their ability to promote moisture related electrical failures. During the final phase of the program, 25 electronic and electrical components were exposed to the two most promising test methods. The selected test method is a modification of the NADC sulfur dioxide salt fog test. It utilizes a much higher exposure temperature and a dilute substitute ocean water solution for fog generation. In one week this test method produces both corrosion damage and electrial failures that correlate with the condition of the test articles exposed for nine to ten months on an aircraft carrier. Author (GRA)

N82-17172# Systran Corp., Dayton, Ohio.
DIGITAL AVIONICS INFORMATION SYSTEM (DAIS) DOCUMENTATION Final Report, Aug. 1979 - Jun. 1981
F. Forster and R. Gregory Wright-Patterson AFB, Ohio AFWAL Sep. 1981 97 p
(Contract F33615-79-C-1818; AF Proj. 2052)
(AD-A108000; AFWAL-TR-81-1162) Avail: NTIS HC A05/MF A01 CSCL 09/2

This report covers the work performed by SYSTRAN Corporation in providing Configuration control, technical editing and generation of documentation for the DAIS Program Branch. This effort encompassed the following functions: (1) maintaining the DAIS library, (2) generating certain specifications, plans, drawings and/or test reports, (3) performing configuration audits per MIL-STD-1521, (4) assuring that DAIS documents conformed to MIL-STD-490 and 483, (5) technical editing and configuration control over all DAIS documentation. The DAIS documentation effort was highly successful and could set an example for other R&D programs on how to properly document their efforts in MIL-STD format. Author (GRA)

N82-17173# Naval Research Lab., Washington, D. C.
FUNCTION SPECIFICATIONS FOR THE A-7E FUNCTION DRIVER MODULE Interim Report
P. C. Clements 27 Nov. 1981 177 p refs
(XF21242101)
(AD-A107922) Avail: NTIS HC A09/MF A01 CSCL 09/2

As part of the experimental redesign of the flight software for the Navy's A-7E aircraft, software modules were designed to encapsulate the characteristics of the behavioral requirements of the system. The purpose of these Function Driver modules is to allow the remainder of the software to remain unchanged when the required system behavior is modified without associated hardware changes. This document specifies the behavior of the system without regard to specific hardware devices. This report contains an explanation of the standard organization of each functional description, a description of the review procedures, specifications for all of the functional aspects of the A-7E software, and a set of indices and cross-references to help integrate this module with the rest of the system. As well as serving as development and maintenance documentation for the A-7E redesign, this document is intended to serve as a model for other people interested in applying our documentation and structuring techniques to other software projects. Author (GRA)

N82-17174*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
CF6 JET ENGINE PERFORMANCE IMPROVEMENT: HIGH PRESSURE TURBINE ROUNDNESS
W. D. Howard and W. A Fasching Jan. 1982 136 p refs
(Contract NAS3-20629)
(NASA-CR-165555; R82AEB115) Avail: NTIS HC A07/MF A01 CSCL 21E

An improved high pressure turbine stator reducing fuel consumption in current CF6-50 turbofan engines was developed. The feasibility of the roundness and clearance response improve-

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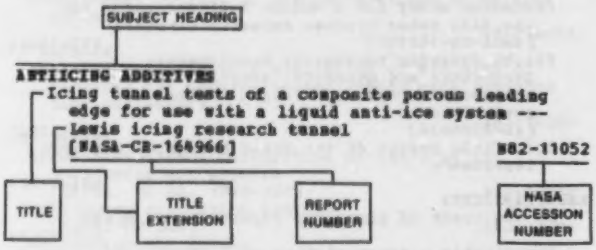
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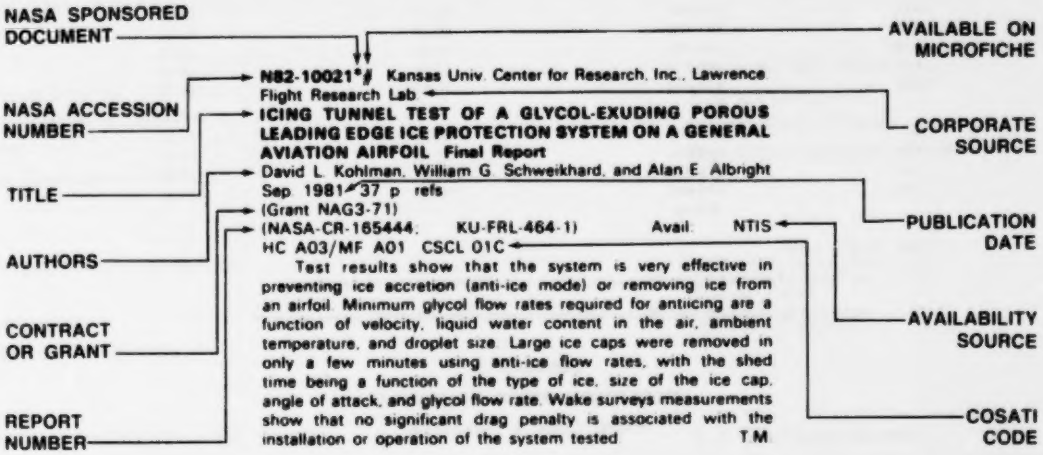

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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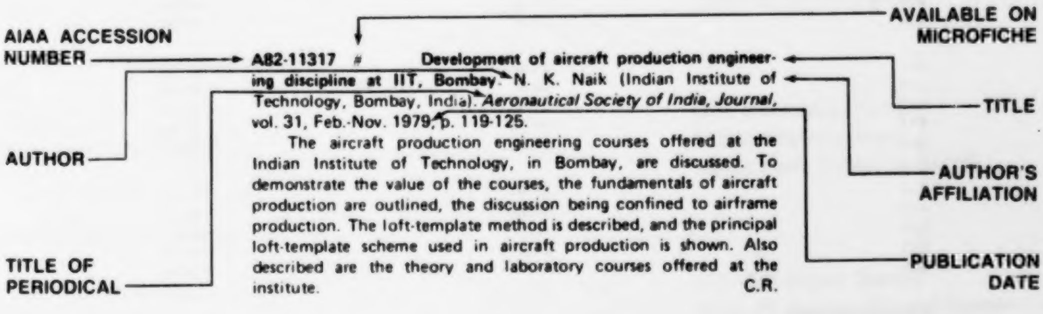

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

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IAA ENTRIES

A82-18874 † **Soviet helicopter construction /2nd revised and enlarged edition/ (Sovetskoe vertoletostroenie /2nd revised and enlarged edition/).** A. M. Izakson. Moscow, Izdatel'stvo Mashinostroenie, 1981. 295 p. 61 refs. In Russian.

A brief history is presented of the development of helicopter construction in the Soviet Union. Following a review of the fundamental design characteristics of the basic classes of helicopters and of the major steps in the development of the Soviet helicopter industry, the prehistory of helicopter construction is traced from the designs of Leonardo da Vinci to Russian helicopter designs in the second half of the 19th century. The first stages in actual construction beginning with advances in aviation in the early 20th century are outlined, and the first Soviet helicopters to be built and operated successfully are presented, including the TsAGI 1-EA, 5-EA and 11-EA models. Attention is then given to the subsequent development of autogyros, true vertical lift helicopters, and present-day helicopters for various applications as exemplified by the Mi, Ka, and Yak series and foreign designs. An evaluation of the current status and future problems in helicopter design is also presented.

A.L.W.

A82-18893 **Transient two-dimensional temperature distributions in air-cooled turbine blades.** K. Gue, X. Ge, and X. Sun (China University of Science and Technology, Hefei, People's Republic of China). *Engineering Thermophysics in China,* vol. 1, July-Sept. 1980, p. 255-264. 10 refs. Translation.

The effect of using varying time increments is studied for finite element techniques for unsteady conduction problems, and a FORTRAN program for solving two-dimensional unsteady temperature field of air-cooled turbine blades is presented. The differential equation of two-dimensional unsteady conduction problems is defined with Robin's condition for inner and outer walls of the blade exchanging heat with the fluid by convection. After discretization into spatial triangular elements, three different discretizations of time are shown: a weighted-residual method, assuming the temperature distribution to be a linear time function, a weighted-residual method, assuming the temperature to be a quadratic time function between each step, and a technique treating the difference quotient of temperature to time as a linear function of time. The highest temperature of the blade was found to occur at the trailing edge and the burning-gas side, using the third time discretization method.

M.S.K.

A82-18894 **Impingement cooling of concave surfaces of turbine airfoils.** J. Cheng and B. Wang (Nanjing Aeronautical Engineering College, Nanjing, People's Republic of China). *Engineering Thermophysics in China,* vol. 1, July-Sept. 1980, p. 275-291. 12 refs. Translation.

Experimental results of impingement cooling of two aluminum specimens of different sizes with three impingement tubes are presented in this paper. The specimens, simulating the leading edge of a turbine blade, were preheated and cooled by jets from different impingement tubes at various flow rates and distances. The lumped capacity method was used to determine the cooling rate of the aluminum specimen. The mean heat transfer coefficients were calculated and correlated with dimensionless parameters. The results of the Nusselt numbers obtained from experiments were consistent with those calculated from the recommended formula. Furthermore, these results were compared with the correlations of Metzger and those of Ravuni and Tabakoff, and it was concluded that the formula proposed by this paper was more reasonable. (Author)

A82-18898 † **The city and aviation (Gorod i aviatsiia).** A. I. Borodach, B. N. Mel'nikov, V. I. Chernikov, and B. I. Berdnik. Moscow, Stroiizdat, 1980. 184 p. 22 refs. In Russian.

Basic information is presented on various types of air transportation facilities that serve cities: airports for conventional aircraft and for STOL and V/STOL aircraft, helicopter stations, and railroad stations connecting the city with the airports. Attention is given to requirements concerning the location of airports in relation to cities; problems of convenient access, noise reduction, and flight safety are considered. The basic principles of the organization of transportation between cities and airports are examined. B.J.

A82-18899 † **Accidents of surface effect ships and hydrofoil craft (Avarii sudov na vozdushnoi podushke i podvodnykh kryl'iakh).** I. M. Korotkin. Leningrad, Izdatel'stvo Sudostroenie, 1981. 216 p. 79 refs. In Russian.

The work describes 200 accidents and disasters of hovercraft and hydrofoil craft of the United States, Great Britain, France, and other fleets which occurred in the 1960s and 1970s as a result of capsizing, storm damage, collisions, fires, explosions, etc. The causes of the accidents, the functioning of various craft systems, and the actions of the crews are examined. Recommendations on the prevention of such accidents are discussed. B.J.

A82-18903 # **Tactical Radar Threat Generator system.** W. T. Harpster and J. L. Gebhart (Emerson Electric Co., St. Louis, MO). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 43-53.

It is pointed out that a military force's survival, and the successful accomplishment of its objective is highly dependent on preconflict training. The success of military training is, in turn, dependent on the accuracy with which the combat environment is duplicated. The combat environment for the crew of an attack aircraft is examined. Realistic training of combat pilots cannot be accomplished unless a typical threat environment is simulated in the target area. A cost effective approach to training involves the procurement of threat emitter equipment which meets certain minimum requirements for effective aircrew training. A suitably low-cost threat simulator is the Tactical Radar Threat Generator (TRTG). The U.S. Army version has become known as 'GRETA' an acronym for Ground Radar Emitter for Training Aviators. Attention is given to TRTG hardware, the digital scan converter, and the scoring equipment. G.R.

A82-18904 # **Design criteria for a miss distance radar.** L. I. Ruffe (Racal-MESL, Ltd., Linlithgow, Scotland). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 54-60. Research supported by the Ministry of Defence (Procurement Executive).

When a missile, fired in connection with development trials or operator training, misses the target, it is most desirable to know by how much it has missed. This miss-distance must be measured dynamics are described by the clamped-free modes. A blade dynamic stiffness matrix of order 4 + 10l, (where l is the number of lacing wires), is formed directly from the blade modal data in the interface displacements between the disk and the blades and between the blades and the lacing wires. The lacing-wires are treated as elastic and massless. The sign-count method and bisection are used to locate the eigenvalues. The method presents no numerical difficulties and is automatic as well as efficient. J.F.

A82-19340 # **On the formulation of coupled/uncoupled dynamics analyses of blade-disc assemblies.** P. S. Kuo (Avco Corp., Avco Lycoming Stratford Div., Stratford, CT). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-126.* 9 p. 6 refs. Members, $2.00; nonmembers, $4.00.

The interaction between the blades and their attachments on a flexible rotor-disc assembly may induce potential vibration problems. Coupled blade-disc resonance, the dissimilar behavior of blade groups, and the uncoupled blade or disc natural frequencies must be evaluated. To satisfy all of the requirements and at the same time reduce the complexity of the analysis, an efficient analytical formulation of a combined blade-disc segment model using finite element rotational symmetry techniques was developed. The capability of the technique, as demonstrated, using a plate-element model, includes computer plots of the blade and disc normalized modal deformations in consecutive segments at the respective natural frequencies. The results are discussed and verified by fundamental vibration theory. Various finite element models of blades and discs are also presented to clarify the modeling procedure. The method is shown to be a cost-effective tool that readily lends itself to daily routine use. (Author)

A82-19342 # **Optimal shape design of turbine blades.** J. P. Queau and P. Trompette (Lyon, Institut National des Sciences Appliquées, Villeurbanne, Rhône, France). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-128.* 6 p. 10 refs. Members, $2.00; nonmembers, $4.00.

This paper attempts to present a general engineering method for minimizing the weight of rotating turbine blades in optimizing the cross section shapes. The constraints originate from either aerodynamic or solid mechanic specifications. As the problem is reformated after a first F.E. analysis the optimization process is quite inexpensive. A large variety of compressor or turbine rotating blades can be designed by this method which uses the variables selected by the aerodynamicists and leads to continuous optimal profiles. (Author)

A82-19343 # **Investigation of vibration of shrouded turbine blades.** J. Wachter and H. Wolfs (Stuttgart, Universität, Stuttgart, West Germany). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-129.* 5 p. 6 refs. Members, $2.00; nonmembers, $4.00.

The grouping of cantilever blades by means of shrouding (bands, plates or damping wires) results in a new vibratory system the theoretical and experimental analysis of which would pose a variety of problems. In order to find some improved approach of numeric predictive computation we must carry out experimental analyses while varying systematically some of the influencing parameters. This paper discusses some static parameter analyses of model blades of simplified geometry. The results obtained are compared with numeric calculations by the finite elements method. (Author)

A82-19344 # **A practical approach to systems mode analysis.** P. W. Spence (General Electric Co., Aircraft Engine Group, Lynn, MA). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-130.* 8 p. 5 refs. Members, $2.00; nonmembers, $4.00.

A simplified methodology is presented for the analysis of disc-blade-shroud assemblies to obtain system mode frequencies and stress and load distributions in the blades. The method uses the cantilever vibration characteristics of the blades with a travelling wave solution applied to the shroud boundary conditions. Theoretical and experimental results are compared and some design criteria are indicated for frequency tuning to meet design objectives. (Author)

A82-19347 # **An investigation of dual mode phenomena in a mistuned bladed-disk.** W. Q. Stange and J. C. MacBain (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-133.* 12 p. 5 refs. Members, $2.00; nonmembers, $4.00.

This paper presents the results of an investigation addressing the effects of mistuning on the lower modes of vibration of a simple bladed-disk model. The phenomena of dual modes, also known as mode splitting, is studied using holographic interferometry and strain gage measurements under nonrotating and rotating conditions. Resonant amplitudes, mode shapes, and natural frequencies of the disk model were determined, without deliberately mistuning the disk. The tests were then repeated with the disk deliberately mistuned to varying degrees, paying particular attention to the second diameter (2N) dual modes. Additionally, tests were conducted on the disk at a rotational speed of 2000 rpm, in an effort to gain insight as to the vibratory characteristics of the disk under rotating conditions. (Author)

A82-19348 # **Measurement of the influence of flow distortions on the blade vibration amplitude in an air turbine.** J. Beckmann and J. Wachter (Stuttgart, Universität, Stuttgart, West Germany). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-135.* 9 p. 6 refs. Members, $2.00; nonmembers, $4.00.

Experimental investigations in an air turbine are carried out to determine the influence of exciting forces due to flow distortions on the vibration amplitudes of a rotating bladed disk. Flow distortions are simulated at different operating points by changing the outlet angle of the guide vanes. The dynamic signals like blade vibrations and fluctuating pressures are measured, transmitted by a five channel telemetry system, stored on a multitrack tape and subsequently analyzed by a real-time analyzer and a computer comparing amplitude and phase shift. (Author)

A82-19349 # **A parametric study of dynamic response of a discrete model of turbomachinery bladed disk.** A. Muszynska (Dayton, University, Dayton, OH) and D. I. G. Jones (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-137.* 12 p. 8 refs. Members, $2.00; nonmembers, $4.00.

A model consisting of n five-degree-of-freedom subsystems has been developed to characterize some of the mechanical response features of a bladed disk system, including four modes of each blade, n bending modes of the disk, blade-to-blade and blade-to-ground Coulomb friction, structural damping, blade-to-blade mistuning, and various types of excitation. The equations of motion and method of solution are described, and numerical results illustrate some of the interesting effects of various levels of frictional damping on tuned and mistuned systems, which may shed light on some aspects of damped system design and performance. (Author)

A82-19351 # **Application of structural optimization technique to reduce the external vibrations of a gas-turbine engine.** H. Bedrossian and R. Phoenix (Avco Corp., Avco Lycoming Stratford Div., Stratford, CT). *American Society of Mechanical Engineers, Design Engineering Technical Conference, Hartford, CT, Sept. 20-23, 1981, Paper 81-DET-143.* 8 p. Members, $2.00; nonmembers, $4.00.

The development of a structural and dynamics finite element model of a complete gas-turbine engine was achieved using the resources of the Integrated Turbine Analysis System, an in-house research program. This system employed interactive graphics and an engineering database to generate a NASTRAN dynamic model of the subject engine. A normal modes analysis identified the natural frequencies and associated mode shapes for the engine structure within its operating range. A forced-response analysis due to the steady-state sinusoidal load of rotor unbalanced was obtained. Results were found to be in good agreement with typical vibration records obtained in a production test cell. The forced response strain energy method was utilized to identify the structural elements primarily contributing to the response. The effect of component stiffness on engine vibration levels and the recommended design modification to reduce these levels, was established. (Author)

A82-19521 # **Analysis and tolerance study of an array antenna for a new generation of secondary radars.** M. Di Fausto, A. Saitto (Selenia S.p.A., Rome, Italy), and G. Pelosi (Roma, Università, Rome, Italy). In: European Microwave Conference, 10th, Warsaw, Poland, September 8-12, 1980, Proceedings. Sevenoaks, .Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 144-148. 11 refs.

An open array antenna is analyzed considering performance and tolerances with respect to the specifications given by Eurocontrol and FAA. Computed results and parametric charts are presented. The analytical methods used are briefly described. Some considerations on the choice of the radiating element (slot or dipole) are given with respect to the desired performance. (Author)

A82-19552 # **Leaky wave antenna using an inverted strip dielectric waveguide.** R. Crampagne, L. Padellec, and A. Sarremejean (ONERA, Centre d'Etudes et de Recherches de Toulouse, Toulouse, France). In: European Microwave Conference, 10th, Warsaw, Poland, September 8-12, 1980, Proceedings. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 474-479. 5 refs.

Experimental results on a leaky wave antenna built from an inverted strip dielectric waveguide are presented, the frequency ranging from 64 to 74 GHz. The frequency scanning for beams inclined backward is investigated, along with the variations of gain and 3 dB beamwidth. An approximate analysis is proposed for calculating the main lobe angle and the radiating space harmonic's amplitude. Comparison between experimental and theoretical results shows that the angle's value (for inclined beams) is very sensitive to machining tolerance. Several approximate theoretical methods are proposed for determining the main lobe angle. C.R.

A82-19621 **Trends in aviation fuels and lubricants; Proceedings of the West Coast International Meeting, Seattle, WA, August 3-6, 1981.** Meeting sponsored by the Society of Automotive Engineers. Warrendale, PA, Society of Automotive Engineers, Inc. (SAE Proceedings SP-492), 1981. 65 p. $9.00.

Trends in aviation fuels and lubricants are reviewed in a historical aspect and with reference to recent measurements which can provide projections for anticipated trends in the near future. Topics discussed include a short history of aviation gasoline development covering the period 1903-1980; a history of aircraft piston engine lubricants; aviation turbine fuel properties and their trends; and finally, the history of aviation turbine lubricants. V.L.

A82-19622 **A history of aircraft piston engine lubricants.** R. V. Kerley. In: Trends in aviation fuels and lubricants; Proceedings of the West Coast International Meeting, Seattle, WA, August 3-6, 1981. Warrendale, Pa, Society of Automotive Engineers, Inc., 1981, p. 15-42. 50 refs.

This paper is a review of the literature covering the history of the use of lubricants. The uses of oils derived from animals, vegetables and minerals are placed in perspective from ancient times to the Wright Brothers' flight in 1903. After that period, the discussion is confined largely to the lubrication of aircraft piston engines. The paper attempts to explain the preference for castor oil in European and British engines and the more general, but by no means exclusive, use of petroleum-based mineral oils in the United States. The background for the continued, and often controversial use of straight mineral oil, some of the additives used, tests of synthetic oil in winter use, and oil reclamation are reviewed through World War II until 1963 when lubricating oils containing ashless additives became the predominant products. (Author)

A82-19623 * **Aviation turbine fuel properties and their trends.** R. Friedman (NASA, Lewis Research Center, Cleveland, OH). In: Trends in aviation fuels and lubricants; Proceedings of the West Coast International Meeting, Seattle, WA, August 3-6, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 43-54. 16 refs.

This paper is an examination of published Jet A inspection data covering selected property distributions, averages, and trends for the period from 1969 to 1979. Yearly median values of aromatics, mercaptan sulfur content, 10-percent distillation temperature, smoke point, and freezing point are changing with time, approaching their specification limit values, particularly in the last three years. A near-specification property is defined as one within a stated tolerance band around the specification limit. On this basis, most fuel samples have one to three near-specification properties, the most common being aromatics, smoke point, and freezing point. (Author)

A82-19624 **The history of aviation turbine lubricants.** R. Knipple and J. Thich (Royal Lubricants Co., Inc., East Hanover, NJ). In: Trends in aviation fuels and lubricants; Proceedings of the West Coast International Meeting, Seattle, WA, August 3-6, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 55-63. 24 refs.

Condensed in this report are the salient points of the forty year history of the development of the gas turbine engine, its associated aircraft and the various lubricants used. Tables are included comparing some of the important specification properties of many of these fluids, both petroleum and synthetics. An explanation is incorporated outlining the reasons synthetics perform well in the turbine engine environment. A genealogical chart detailing the various dates on which lubricant specifications or important changes were issued is provided. There are indications that some commercially available lubricants are being stressed to the limits of the fluids capabilities. Any new engine designs, therefore, may require entirely new lubricants and/or new lubrication systems. (Author)

A82-19649 # **The significance of electronics for air traffic control at the present time and in the future (Die Bedeutung der Elektronik für die Flugsicherung in Gegenwart und Zukunft).** K. Platz (Bundesanstalt für Flugsicherung, Frankfurt am Main, West Germany). *Luft- und Raumfahrt,* vol. 2, 4th Quarter, 1981, p. 109-112, 114-116. In German.

It is pointed out that the current Air Traffic Control (ATC) system is the result of an evolutionary development process, taking place during the last thirty years. The ATC system can perform its tasks only by making use of the advances made in the area of electronics. The system aids provided for the air traffic controller must be continuously improved in connection with the adaptation of ATC to aircraft-related technological advances. Improved ACT procedures make it also possible to enhance the control capacity of the system in response to increases in the volume of air traffic. Attention is given to the technical system of ATC, future developments on the international level, and technological possibilities for future ATC systems. The use of an onboard computer is considered along with traffic flow control, a European flight-plan data bank, the telecommunication network for aviation, an enlarged radar system, data transmission, new data-display methods, and the cost of ATC. G.R.

A82-19733 # **Technical evaluation report of the AGARD Fluid Dynamics Panel Symposium on computation of viscous-inviscid interactions (Rapport d'evaluation technique du Symposium organisé par la Commission de Dynamique des Fluides de l'AGARD sur le calcul de l'interaction fluide-parfait-fluide visqueux).** J. C. Le Balleur (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Association Aéronautique et Astronomique de France, Colloque d'Aérodynamique Appliquée, 18th, Poitiers, France, Nov. 18-20, 1981.) ONERA, TP* no. 1981-116, 1981. 9 p. 31 refs. In French.

The symposium surveys the status of current research in computational aerodynamics based on methods solving a viscous-inviscid interaction problem. In spite of limitation in the models or numerical techniques for shock wave boundary layer interaction or trailing edge problems, the situation is well advanced in unseparated, steady two-dimensional flow, with the potential approximation for the inviscid part. Progress has advanced in the computation of separations, based on strong interaction models. It would be fruitful to make use of the complete Euler equations in transonic flow. Progress toward strong interaction methods is much less advanced in unsteady or three-dimensional flow, but seems likely. The development of strong interaction methods, highly connected with that of inviscid and Navier-Stokes numerical techniques, appears as mandatory to having access to practical application needs. (Author)

A82-19737 # **A progress report on the European Transonic Wind Tunnel Project (Le Projet de Soufflerie Transsonique euro-**

radio navigation system that will provide extremely accurate three-dimensional position fixes and timing information to properly equipped users anywhere on or near the earth. Civil applications of GPS are mostly limited to either air or marine navigation. In 1977, an investigation was initiated with the objective to prove the feasibility of land navigation with a low cost, single channel, single frequency GPS receiver based on the C/A code only. A GPS receiver was built and static and dynamic tests were conducted. An accuracy of 20 meters was obtained. It was found that the low-cost navigation algorithms used provide adequate and acceptable performance for land navigation. The receiver performance has been excellent even under the adverse environments, such as downtown San Francisco and San Francisco International Airport. G.R.

A82-20672 **The influence of technology advances on integrated CNI avionics.** R. A. Reilly and C. R. Ward (ITT, ITT Avionics Div., Nutley, NJ). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 61.3.1-61.3.6.

Attention is given to an integrated communication, navigation, and identification avionics (ICNIA) architecture which represents an attempt to overcome current-day tactical avionics problems in a highly cost effective manner. This architecture uses a wideband, agile, programmable transversal filter, as a key element of the design. The use of such a device as a preselector filter reduces the input bandwidth from approximately 400 MHz to 5 MHz, which is the spectrum bandwidth of a Joint Tactical Information Distribution System (JTIDS) pulse. Under digital control, the filter is capable of switching tuning frequencies in less than six nanoseconds. This rapid tuning feature makes it possible for a single filter to scan all of a selected set of frequencies in the L-band region within the total delay time of the tapped delay line in the transversal filter. Expected benefits of ICNIA are related to gains with respect to size, weight, cost, as well as performance. G.R.

A82-20684 **Relay-augmented data links in an interference environment.** C. E. Cook (Mitre Corp., Bedford, MA). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 63.6.1-63.6.5. Contract No. F19628-79-C-0001.

Use of communications relays is examined as a means of improving the operation of line-of-sight links in an interference environment. Expressions are derived that define optimum relay locations and number of relays. The relationships are functions of system and interference parameters, such as effective radiated power (EFP) ratios and processing gain, as well as of distances from the source transmitter and destination receiver to the noise source position. Bounds on flight path orbits of airborne relays are derived. Results obtained can be applied to the analysis of trade-offs among the various design factors when communications links are subject to interference. This can include the assessment of fixed constraints, such as the number of relays, upper limits on ERP and processing gain, or lower limits on data rate. An example is presented that illustrates the effectiveness of a relay in creating a communications corridor in the presence of multiple interference sources. (Author)

A82-20695 **An analysis of antijam communication requirements in fading media.** J. D. Oetting and A. E. Durling (Booz, Allen and Hamilton, Inc., Bethesda, MD). In: NTC '80; National Telecommunications Conference, Houston, TX, November 30-December 4, 1980, Conference Record. Volume 4. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 69.3.1-69.3.5. 6 refs.

The paper discusses the effects of jamming in a multipath propagation environment in which both the desired signal and the jamming signal are subject to Rice or Rayleigh fading. The distribution of the ratio of two independent Rician random variables is calculated, and this result is related to the evaluation of the required processing gain for the case of air-to-air or air-to-ground communication in a hostile electronic environment. An example of a specific jamming scenario is employed to illustrate how these results can be used to estimate the required processing gain of an airborne UHF AJ communication system. (Author)

A82-20728 # **Padé approximation applied to flow past thin airfoils.** S. N. Venkatarangan and G. Narendran (Indian Institute of Technology, Madras, India). *Journal of Mathematical and Physical Sciences*, vol. 14, Oct. 1980, p. 485-489.

Padé approximations derived from nonuniform solutions of flows around elliptic and Joukowski airfoils are examined. Off-diagonal Padé approximants are chosen for the flow past elliptic airfoils and poles are obtained. A perturbation expansion is defined for flow past a Joukowski type airfoil, and nondiagonal Padé approximants are used to accommodate the stagnation point at the leading edge. Comparisons of the values obtained are made with values obtained by the Lighthill method. M.S.K.

A82-20742 * # **Improved plasma sprayed MCrAlY coatings for aircraft gas turbine applications.** F. J. Pennisi and D. K. Gupta (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Vacuum Society, International Conference for Metallurgical Coatings, San Francisco, CA, Apr. 6-10, 1981, Paper.* 17 p. 11 refs. Contract No. NAS3-21730.

Eighteen plasma sprayed coating systems, nine based on the NiCoCrAlY chemistry and nine based on the CoCrAlY composition, were evaluated to identify coating systems which will provide equivalent or superior life to that shown by the electron beam physical vapor deposited NiCoCrAlY and CoCrAlY coatings respectively. NiCoCrAlY-type coatings were examined on a single crystal alloy and the CoCrAlY based coatings were optimized on the B1900 + Hf alloy. Cyclic burner rig oxidation and hot corrosion and tensile ductility tests were used to evaluate the various coating candidates. For the single crystal alloy, a low pressure chamber plasma sprayed NiCoCrAlY + Si coating exhibited a 2X oxidation life improvement at 1121 C (2050 F) over the vapor deposited NiCoCrAlY material while showing equivalent tensile ductility. A silicon modified low pressure chamber plasma sprayed CoCrAlY coating was found to be more durable than the baseline vapor deposited CoCrAlY coating on the B1900 + Hf alloy. (Author)

A82-20743 * # **Power system design optimization using Lagrange multiplier techniques.** Y. Yu (Xerox Corp., El Segundo, CA) and F. C. Lee (Virginia Polytechnic Institute and State University, Blacksburg, VA). *Power Conversion International Conference, Munich, West Germany, Sept. 14, 1981, Paper.* 18 p. 8 refs. Contract No. NAS3-21051.

An optimization technique using the Lagrange Multiplier Method is proposed to facilitate design of switching power converter systems. The essence of the optimization is to identify the optimal battery voltage level and switching frequency along with the detailed converter design so that the total system weight including the battery and the packaged converter is minimized, and concurrently all specified power circuit performances are satisfied. (Author)

A82-20751 **Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.** Symposium sponsored by the Society of Flight Test Engineers. Lancaster, CA, Society of Flight Test Engineers, 1980. 451 p.

Flight testing procedures were discussed in terms of F-18 carrier suitability testing, the suitability of using JP-8 fuel for U.S. combat aircraft assigned to NATO forces, and icing test programs for the F-16 and for helicopters. Methods of instrumenting a test airplane were examined, as well as the development of a self-contained flight test data acquisition system. Attention was given to fuel conservation data bases for general aviation aircraft, to flight testing the airborne cruise missile, and testing the Jetwing STOL research aircraft. Tests of the Tornado advanced avionics system were described, as were tests of a jet-powered sailplane, flight tests of effect, and flyover noise level tests. Finally, size reduction of flight test instrumentation and simulator data test instrumentation were considered, and data processing for flight tests and real-time telemetry were reviewed. M.S.K.

A82-20752 **Initial F-18 carrier suitability testing.** J. W. Hakanson (McDonnell Douglas Corp., Patuxent River, MD). In:

Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 1-1 to 1-14.

Sea Trials results are reported for carrier basing of the F-18 Hornet, and the instrumentation characteristics are described. Complete ground tests, simulations, and drop tests were performed before the carrier tests, and catapult launches were immediately successful. EMC, deck handling/operation, instrumentation, and data system tests are outlined, noting that real-time data was transmitted to the manufacturer. Thirty-two catapults and 32 arrested landings were completed onboard a carrier, with little pilot compensation for burble and no unintentional bolters. Further trials established startability with the APU, engine crossbleed, and the low and high pressure huffer, use of six different catapults, compatability with shipboard operations, and the need for a fix of the lower nose wheel spin-up speed to alleviate loads on the repeatable release holdback springs. M.S.K.

A82-20753 **F-16 ground and inflight icing testing.** C. M. Core, Jr. (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 3-1 to 3-35. 13 refs.

The discovery of icing problems in the F-16 variable inlet vanes, the fixes and the tests necessary to correct the problem, and the design of further tests to assure that military anti-icing specifications are met are discussed. The icing problem was detected during the AF qualifications programs when a second stage glime ice test flown within an ice cloud produced from a tanker aircraft caused damage in nine stages of the fan blades. Subsequent decisions were made to heat the airframe inlet strut, retrofit a three position anti-ice switch into existing F-16s, and improve the icing test procedures and in particular the quality of the ice. Further icing observed in an operational status led to a test program to investigate the effectiveness of electrically heating the inlet strut and moving the anti-ice sensor probe forward. Suggestions are offered for more accurate military specifications for defining ice and ice survival conditions. M.S.K.

A82-20754 **Helicopter icing spray system.** D. Belte (U.S. Army, Aviation Engineering Flight Activity, Edwards AFB, CA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 4-1 to 4-18. 8 refs.

The U.S. Army has used a CH-47C as an airborne spray tanker since 1973 for helicopter qualification testing in icing conditions. The initial icing cloud it produced was found to consist of much larger diameter drops than natural clouds, and problems existed in uniformity and control of its liquid water content. A program was undertaken in 1979 to modify the system to generate a spray plume more closely resembling a natural cloud. This effort included ground and icing wind tunnel evaluation of spray atomizers, a flight survey of turbulence behind the spray aircraft, and in-flight evaluation of atomizer spray characteristics. Modifications were incorporated, and the new system was used for icing tests in 1980. Evaluation of the new spray cloud characteristics shows a vastly improved drop size distribution and a more homogeneous liquid water content, closely resembling that of a natural cloud. (Author)

A82-20755 **JP-8 fuel conversion evaluation.** R. A. Stambovsky (USAF, Flight Test Center, Edwards AFB, CA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 6-1 to 6-32. 26 refs.

The test results of determining the operability of the OV-10A, F-5, and A-37B aircraft on both JP-4 and JP-8 fuel to assure compatibility with NATO fuels are reported. Air starts, throttle transients, low temperature tests, thrust stand tests, weight and balance, and smoke evaluations were performed, using on and off trim conditions. Technical specifications were developed for the airstart envelope, preheating procedures, and fuel control gravity settings when using the NATO F-34 (JP-8) fuel. JP-8 is a kerosene type fuel with a higher specific gravity and flash point than JP-4 fuel, leading to safer handling but a greater weight penalty and more limited airstart features. Low temperature starts were within the manual described limits, as were throttle techniqes and center-of-gravity shifts. M.S.K.

A82-20756 * **Development of a simple, self-contained flight test data acquisition system.** R. R. L. Renz, R. Clarke, and J. Roskam (Kansas, University, Lawrence, KS). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 8-1 to 8-22. 16 refs. NASA-supported research.

The system concepts and the flight test program results for a NASA designed in-flight data acquisition system are described. The system draws power from a rechargeable battery pack and intrudes on the aircraft systems only with a total pressure probe, a static pressure probe, and control position transducers, which are simply taped to the frame. A 4000 byte microcomputer forms the heart of the data recording system for cassette tape storage, and is expansion coupled to an eight-bit interactive microcomputer which interfaces with a transducer package for 16-channel demultiplexing. The transducers, ranges, and accuracies are listed, and a five/sec data acquisition rate minimum requirement is noted, although a 10/sec rate is used. The system components are detailed, along with the control and data processing procedures, and the results of dynamic flight testing are presented. M.S.K.

A82-20757 **General aviation fuel conservation in the 1980's.** G. R. Bromley (Beech Aircraft Corp., Wichita, KS). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 9-1 to 9-22.

Techniques for conserving fuel in-flight are given from a flight engineer's point-of-view, noting that aircraft designs will increasingly incorporate cleaner aerodynamics and better engine-to-airframe matching. The effects of wind and temperature at various altitudes and fuel consumption in ascent and descent are considered, and methods for determining maximum range airspeeds are developed, particularly for choosing long-range cruise airspeeds. Specific charts are presented for private pilots in general aviation aircraft, relating wind, no-wind, and tailwind conditions as regards to fuel consumption. M.S.K.

A82-20759 * **Determining performance parameters of general aviation aircraft.** G. Bull and P. D. Bridges (Mississippi State University, Mississippi State, MS). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 12-1 to 12-16. 6 refs. Grant No. NAG1-3.

A method for determining propeller efficiency and drag from flight tests, using relatively simple instrumentation, is under development at Mississippi State University. Flight test data from several simple maneuvers are combined to produce sufficient information to determine the desired parameters. Information obtained from the transient response of airspeed to a step change in power or drag in level flight is utilized. Theory is developed and results of preliminary computer studies and preliminary flight test are presented. (Author)

A82-20760 **Tornado-avionic development testing.** E. K. Obermeier (Messerschmitt-Bölkow-Blohm GmbH, Manching, West Germany). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 13-1 to 13-17.

The developmental testing of navigation and terrain following subsystem of the avionics system in the Tornado all-weather combat aircraft are described. Navigation data supplied by inertial navigation, Doppler radar, SAHR, ADC, and sensor data are fed to the main computer through a Kalman filter. The system is hierarchical and reverts to successively lower navigation modes in case of damage to the primary equipment. Quantified flight tests were made during 100 nm flights around the terrain near the air base and the radar tracking

US-Patent-Class-73-178R) Avail: US Patent and Trademark Office CSCL 01D

A display device is disclosed which is particularly suited for providing the pilot of an aircraft with combined inflight altitude, heading, altitude, and horizontal situation information previously available only by using two or three devices providing separate displays. The preferred embodiment combines a commonly used and commercially available flight director-type device for providing a display in combination with a miniature aircraft supported for angular displacement from a vertical orientation to indicate heading error, or heading offset, and an extended course deviation indicator bar which projects into juxtaposition with the miniature aircraft for providing a true picture of the aircraft's horizontal situation relative to a selective VOR, ILS, or MLS course.

Official Gazette of the U.S. Patent and Trademark Office

N82-16076*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THREAT PERCEPTION WHILE VIEWING SINGLE INTRUDER CONFLICTS ON A COCKPIT DISPLAY OF TRAFFIC INFORMATION

Stephen R. Ellis and Everett Palmer Jan. 1982 17 p refs
(NASA-TM-81341; A-8798) Avail: NTIS HC A02/MF A01 CSCL 01D

Subjective estimates of the threat posed by a single intruder aircraft were determined by showing pilots photographs of a cockpit display of traffic information. The time the intruder was away from the point of minimum separation was found to be the major determinant of the perception of threat. When asked to choose a maneuver to reduce the conflict, pilots selected maneuvers with a bias toward those that would have kept the intruders in sight had they been visible out the cockpit window.

Author

N82-16077# Boeing Commercial Airplane Co., Seattle, Wash.

AIRCRAFT ALERTING SYSTEMS STANDARDIZATION STUDY. VOLUME 2: AIRCRAFT ALERTING SYSTEM DESIGN GUIDELINES Final Report

B. L. Berson, D. A. Po-Chedley, G. P. Boucek, D. C. Hanson, M. F. Leffler, and R. L. Wasson Jan. 1981 186 p refs
(Contract DOT-FA79WA-4266)
(AD-A106732; D6-49976TN; FAA-RD-81-38-vol-2) Avail: NTIS HC A09/MF A01 CSCL 01/4

This report is one of a series of documented studies directed to the improvement and standardization of aircraft alerting systems. The purpose of the study was to develop and validate, through simulation, functional design criteria that can be used in designing effective aircraft alerting systems. The major objectives of this phase of the study were to: resolve system component questions; validate the two candidate system/concepts by comparison to a representative baseline system, for both the pilot and flight engineer stations; evaluate presentation media and display formats for time-critical warnings; and develop guidelines for the design of alerting systems. This document presents a set of design guidelines directed to the improvement and standardization of aircraft alerting systems. The objective of the guidelines is not to define a simple hardware design that each manufacturer must use, but rather to provide functional design criteria that can be used to develop effective alerting systems, and to promote standardization within the industry.

GRA

N82-16079# TRW Defense and Space Systems Group, Redondo Beach, Calif.

DIGITAL AVIONICS INFORMATION SYSTEM (DAIS): DEVELOPMENT AND DEMONSTRATION Final Report, 1 Oct. 1978 - 31 Jul. 1981

M. J. Cook, R. C. Mason, J. L. Stautberg, L. E. Self, R. L. Ellison, and M. J. Strathman Wright-Patterson AFB, Ohio AFWAL Sep. 1981 201 p
(Contract F33615-78-C-1502; AF Proj. 2052)
(AD-A107906; AFWAL-TR-81-1165) Avail: NTIS HC A10/MF A01 CSCL 09/2

The Digital Avionics Information System (DAIS) represents a significant advance in the technology of avionics system architecture. DAIS is a total systems concept, exploiting standardization, modularity, and application independent executive software to provide a system architecture adaptable to many aircraft, missions, and avionics configurations and fully capable of accommodating new advances in technology. These fundamental system characteristics are described in this report, the specific system features which provide these characteristics and attributes are presented.

GRA

N82-16080*# United Technologies Research Center, East Hartford, Conn.

RESEARCH AND DEVELOPMENT PROGRAM FOR NON-LINEAR STRUCTURAL MODELING WITH ADVANCED TIME-TEMPERATURE DEPENDENT CONSTITUTIVE RELATIONSHIPS Final Report

Kevin P. Walker 25 Nov. 1981 187 p refs
(Contract NAS3-22055)
(NASA-CR-165533; PWA-5700-50) Avail: NTIS HC A09/MF A01 CSCL 21E

Results of a 20-month research and development program for nonlinear structural modeling with advanced time-temperature constitutive relationships are reported. The program included: (1) the evaluation of a number of viscoplastic constitutive models in the published literature; (2) incorporation of three of the most appropriate constitutive models into the MARC nonlinear finite element program; (3) calibration of the three constitutive models against experimental data using Hastelloy-X material; and (4) application of the most appropriate constitutive model to a three dimensional finite element analysis of a cylindrical combustor liner louver test specimen to establish the capability of the viscoplastic model to predict component structural response.

M.D.K.

N82-16081*# Pratt and Whitney Aircraft Group, East Hartford, Conn.

STUDY OF CONTROLLED DIFFUSION STATOR BLADING. 1. AERODYNAMIC AND MECHANICAL DESIGN REPORT

E. Canal, B. C. Chisholm, D. Lee, and D. A. Spear Jan. 1981 97 p refs
(Contract NAS3-22008)
(NASA-CR-165500; PWA-5698-28) Avail: NTIS HC A05/MF A01 CSCL 21E

Pratt & Whitney Aircraft is conducting a test program for NASA in order to demonstrate that a controlled-diffusion stator provides low losses at high loadings and Mach numbers. The technology has shown great promise in wind tunnel tests. Details of the design of the controlled diffusion stator vanes and the multiple-circular-arc rotor blades are presented. The stage, including stator and rotor, was designed to be suitable for the first-stage of an advanced multistage, high-pressure compressor.

Author

N82-16083*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

COMPARISON OF ACOUSTIC DATA FROM A 102 MM CONIC NOZZLE AS MEASURED IN THE RAE 24-FOOT WIND TUNNEL AND THE NASA AMES 40- BY 80-FOOT WIND TUNNEL

A. Atencio, Jr. and J. McKie (Royal Aircraft Establishment, England) Jan. 1982 23 p refs
(NASA-TM-81343; A-8801) Avail: NTIS HC A02/MF A01 CSCL 21E

A cooperative program between the Royal Aircraft Establishment (RAE), England, and the NASA Ames Research Center was initiated to compare acoustic measurements made in the RAE 24-foot wind tunnel and in the Ames 40- by 80-foot wind tunnel. The acoustic measurements were made in both facilities using the same 102 mm conical nozzle supplied by the RAE. The nozzle was tested by each organization using its respective jet test rig. The mounting hardware and nozzle exit conditions were matched as closely as possible. The data from each wind tunnel were independently analyzed by the respective organization. The results from these tests show good agreement. In both facilities, interference with acoustic measurement is evident at angles in the forward quadrant.

Author

N82-16084*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NASA RESEARCH ACTIVITIES IN AEROPROPULSION

John F. McCarthy, Jr. and Richard J. Weber 1982 30 p refs
Presented at the 24th Ann. Conf. on Aviation and Astronautics, Tel Aviv, Israel, 17-18 Feb. 1982
(NASA-TM-82788; E-1113) Avail: NTIS HC A03/MF A01 CSCL 21E

NASA is responsible for advancing technologies related to air transportation. A sampling of the work at NASA's Lewis Research Center aimed at improved aircraft propulsion systems is described. Particularly stressed are efforts related to reduced noise and fuel consumption of subsonic transports. Generic work in specific disciplines are reviewed including computational analysis, materials, structures, controls, diagnostics, alternative fuels, and high-speed propellers. Prospects for variable cycle engines are also discussed. Author

N82-16085# Ford Motor Co., Dearborn, Mich.
BRITTLE MATERIALS DESIGN, HIGH TEMPERATURE GAS TURBINE Final Report, 1 Jul. 1971 - 31 Aug. 1979
Arthur F. McLean and Eugene A. Fisher Mar. 1981 232 p refs
(Contract DAAG46-71-C-0162; DARPA Order 1849)
(AD-A106670; AMMRC-TR-81-14) Avail: NTIS HC A11/MF A01 CSCL 21/5

A goal of 200 hours of engine rig demonstrations for representative duty cycle temperatures in a regenerated vehicular gas turbine was chosen, with uncooled ceramic components to operate at least 25 hours at 2500 F, beyond the temperatures possible with uncooled metal components. The total systems approach included major efforts in ceramic design, materials development, fabrication process development, and test and evaluation methodology. Progress was made in each of these areas during the course of the program. For example, the strength of reaction bonded silicon nitride (RBSN) used in the stator and rotor blades was more than tripled. By the end of the program, 200 hours of duty cycle durability on turbine test rigs (between 1930 F - 2500 F) was attained on RBSN stationary components including stators, nose cones and turbine rotor tip shrouds. Similarly, 200 hours of duty cycling on test rigs was attained with reaction sintered SiC combustors and stators. GRA

N82-16086# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Turbine Engine Div.
A COMPUTER PROGRAM FOR VARIABLE-GEOMETRY SINGLE-STAGE AXIAL COMPRESSOR TEST DATA ANALYSIS (UD0400) Interim Report, 1 Jun. 1980 - 31 May 1981
C. Herbert Law Sep. 1981 147 p refs
(AF Proj. 2307)
(AD-A106676; AFWAL-TR-81-2078) Avail: NTIS HC A07/MF A01 CSCL 21/5

This report describes a computer program that is designed for the analysis of single-stage axial compressor data. The axisymmetric flow of a thermally perfect compressible fluid is assumed, and the streamline curvature method of solution is employed. Details of the blade geometry may be computed or input, and a detailed account of the flow through the blading may be obtained. The analysis is limited to a single-stage compressor, but inlet guide vanes may be included. Variable geometry is permitted in both the inlet guide vanes and the stator vanes. An option in the analysis is to match computed and experimental static pressures at any radius by varying annulus blockage or relative flow deviation angles. Author (GRA)

N82-16087*# Analytical Mechanics Associates, Inc., Mountain View, Calif.
AN INVESTIGATION OF AUTOMATIC GUIDANCE CONCEPTS TO STEER A VTOL AIRCRAFT TO A SMALL AVIATION FACILITY SHIP
J. A. Sorensen, T. Goka, A. V. Phatak, and S. F. Schmidt Jul. 1980 253 p refs
(Contract NAS2-10288)
(NASA-CR-152407) Avail: NTIS HC A12/MF A01 CSCL 01C

A detailed system model of a VTOL aircraft approaching a small aviation facility ship was developed and used to investigate several approach guidance concepts. A preliminary analysis of the aircraft-vessel landing guidance requirements was conducted. The various subelements and constraints of the flight system are described including the landing scenario, lift fan aircraft, state rate feedback flight control, MLS-based navigation, sea state induced ship motion, and wake turbulence due to wind-over-deck effects. These elements are integrated into a systems model with various guidance concepts. Guidance is described in terms of lateral, vertical, and longitudinal axes steering modes and approach and landing phases divided by a nominal hover (or stationkeeping) point defined with respect to the landing pad. The approach guidance methods are evaluated, and the two better steering concepts are studied by both single pass and Monte Carlo statistical simulation runs. Four different guidance concepts are defined for further analysis for the landing phase of flight. J.M.S.

N82-16088*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AUTOMATION OF ON-BOARD FLIGHTPATH MANAGEMENT
Heinz Erzberger Dec. 1981 22 p refs
(NASA-TM-84212; A-8808) Avail: NTIS HC A02/MF A01 CSCL 07C

The status of concepts and techniques for the design of onboard flight path management systems is reviewed. Such systems are designed to increase flight efficiency and safety by automating the optimization of flight procedures onboard aircraft. After a brief review of the origins and functions of such systems, two complementary methods are described for attacking the key design problem, namely, the synthesis of efficient trajectories. One method optimizes en route, the other optimizes terminal area flight; both methods are rooted in optimal control theory. Simulation and flight test results are reviewed to illustrate the potential of these systems for fuel and cost savings. J.M.S.

N82-16089*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
A PROGRAM TO EVALUATE A CONTROL SYSTEM BASED ON FEEDBACK OF AERODYNAMIC PRESSURE DIFFERENTIALS Final Report
David W. Levy, Paul Finn, and Jan Roskam Dec. 1981 205 p refs
(Grant NAG4-5)
(NASA-CR-163466; KU-FRL-490-2) Avail: NTIS HC A10/MF A01 CSCL 01C

The use of aerodynamic pressure differentials to position a control surface is evaluated. The system is a differential pressure command loop, analogous to a position command loop, where the surface is commanded to move until a desired differential pressure across the surface is achieved. This type of control is more direct and accurate because it is the differential pressure which causes the control forces and moments. A frequency response test was performed in a low speed wind tunnel to measure the performance of the system. Both pressure and position feedback were tested. The pressure feedback performed as well as position feedback implying that the actuator, with a break frequency on the order of 10 Rad/sec, was the limiting component. Theoretical considerations indicate that aerodynamic lags will not appear below frequencies of 50 Rad/sec, or higher. S.L.

N82-16090*# Goodyear Aerospace Corp., Akron, Ohio.
STUDY OF GROUND HANDLING CHARACTERISTICS OF A MARITIME PATROL AIRSHIP Contractor Final Report, Oct. 1980 - Mar. 1981
Mar. 1981 280 p refs
(Contract NAS2-10448)
(NASA-CR-166253; GER-16948) Avail: NTIS HC A13/MF A01 CSCL 01E

Mooring concepts appropriate for maritime patrol airship (MPA) vehicles are investigated. The evolution of ground handling systems and procedures for all airship types is reviewed to ensure that appropriate consideration is given to past experiences. A tri-rotor maritime patrol airship is identified and described. Wind loads on a moored airship and the effects of these loads on vehicle design are analyzed. Several mooring concepts are assessed with respect to the airship design, wind loads, and mooring site considerations. Basing requirements and applicability of expeditionary mooring also are addressed. Author

N82-16091*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CALIBRATION OF THE AMES ANECHOIC FACILITY. PHASE 1: SHORT RANGE PLAN Final Report, Dec. 1980
David Hickey, Paul T. Soderman, K. Karamcheti, S. P. Koutsoyannis, R. Hopkins, and B. McLachlan Dec. 1980 128 p refs
Prepared in cooperation with Stanford Univ., Calif.
(NASA-TM-84081) Avail: NTIS HC A07/MF A01 CSCL 14B

A calibration was made of the acoustic and aerodynamic characteristics of a small, open-jet wind tunnel in an anechoic room. The jet nozzle was 102 mm diameter and was operated subsonically. The anechoic-room dimensions were 7.6 m by 5.5 m by 3.4 m high (wedge tip to wedge tip). Noise contours in the chamber were determined by various jet speeds and exhaust collector positions. The optimum nozzle/collector separation from an acoustic standpoint was 2.1 m. Jet velocity profiles and turbulence levels were measured using pressure probes and hot wires. The jet was found to be symmetric, with no unusual characteristics. The turbulence measurements were hampered by oil mist contamination of the airflow. Author ments was demonstrated. Application of these improvements will result in a cruise SFC reduction of 0.22 percent for new engines. For high time engines, the improved roundness and response characteristics results in an 0.5 percent reduction in cruise SFC. A basic life capability of the improved HP turbine stator in over 800 simulated flight cycles without any sign of significant distress is shown. E.A.K.

N82-17176# Pratt and Whitney Aircraft Group, West Palm Beach, Fla.
DAMAGE TOLERANT DESIGN FOR COLD-SECTION TURBINE ENGINE DISKS Final Report, Aug. 1977 - Feb. 1981
C. H. Cook, H. E. Johnson, and C. E. Spaeth Wright-Patterson AFB, Ohio AFWAL Jun. 1981 243 p
(Contract F33615-77-C-2064; AF Proj. 3066)
(AD-A107863; PWA-FR-14442; AFWAL-TR-81-2045) Avail: NTIS HC A11/MF A01 CSCL 21/5

This report describes the development, test evaluation, and refinement of a Damage Tolerant Design System for cold-section turbine engine disks. To substantiate the Design System the 42-month effort included the design and test of a functional replacement 2nd-stage fan disk for the F100 engine. This disk would be able to support a 0.030-inch crack for three maintenance intervals without a rapid fracture failure. The program was totally successful and resulted in a disk design that was three pounds heavier than the Bill of Material (B/M) disk but had over ten times the B/M life even with a 0.030-inch crack in the bolthole and a 0.020 inch elox crack starter in the rim slot. Included in this report are the design criteria and rationale used in creation of the damage tolerant configuration, the testing and analysis methodology, and results as well as recommendations for application and improvements. GRA

N82-17177# Strategic Air Command, Offutt AFB, Nebr. Aircraft Engineering Div.
MAINTENANCE POSTURE FOR QUICK START Final Report
John M. Connolly 12 Aug. 1981 46 p
(AD-A107553; SAC/LGME-ER-P-328) Avail: NTIS HC A03/MF A01 CSCL 12/5

Quick start is an aircraft modification which installed cartridge starters on all engines of the B-52G/H and non-fan KC-135 aircraft. Routine peacetime use of the modification was suspended due to an excessive amount of smoke and toxic gases created by the cartridge exhaust. The SAC Aircraft Engineering Division then investigated respiratory and eye protection for ground crew personnel. As an interim solution, they found that an aircraft firefighter's smoke mask connected to a Mine Safety Appliance Corp Type N model SW as filter canister adequately protects the user. To minimize the crew chief's exposure to the smoke cloud, the Division designed and tested a roll-over chock, evaluated a wireless interphone communication system, and implemented alert B-52 battery engine starts. With these new concepts, response timing is only limited to aircrew checklist items and engine start time. GRA

N82-17178# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THROUGH FLOW CALCULATIONS IN AXIAL TURBOMACHINES
C. Hirsch, ed. (Vrije Universiteit, Brussels) and J. D. Denton, ed. (Cambridge Univ.) Oct. 1981 330 p refs
(AGARD-AR-175) Avail: NTIS HC A15/MF A01

The objectives were to review the existing information on blade performance and wall effect prediction, and to extend this information by systematic application of numerical methods to representative geometries. Only axial turbomachines were examined and they were split into a turbine sub-group and a compressor sub-group. Axial turbine performance predicted included an examination of the influence of correlations and computational procedures on the prediction of overall efficiency. A comprehensive survey of the various loss and deviation mechanisms was conducted for the compressor sub-group.

N82-17180# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
INFLUENCE OF CORRELATIONS AND COMPUTATIONAL METHODS ON THE PREDICTION OF OVERALL EFFICIENCY
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 29-31 refs

Avail: NTIS HC A15/MF A01

The process of designing a gas turbine or a steam turbine begins with an evaluation of the influence of component design parameters on the overall cost. For both the steam turbine and the gas turbine, energy costs are rapidly increasing and component efficiency is therefore a primary design objective. For the aircraft gas turbine, the weight of the component influences the fuel consumption and is therefore also an important energy cost consideration. Turbine efficiency predictions, together with information which influence the weight and cost, were obtained from flow field calculations which define the thermodynamic properties and velocity triangles throughout the turbine. These computational methods may be full span through flow calculations which predict the fluid properties from the hub to the tip between each blade row or they may be mean line calculations. In either case they are dependent upon loss and deviation models for their effectiveness in the efficiency optimization stage of the design process. The loss and deviation correlations which are in common use by steam turbine and gas turbine manufacturers are frequently developed internally and are maintained as proprietary information. The overall efficiency predictions which are discussed are therefore limited to results obtained using the correlations built into the methods which are described. T.M.

N82-17183# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE TWO STAGE AERO ENGINE TURBINE
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 69-83 ref

Avail: NTIS HC A15/MF A01

The turbine was a model of the H.P. and I.P. stages of an aircraft gas turbine with the two rotors running at different speeds. It was 'cold flow' tested using air at 420 K and 2.95 bar. Both hot wire and pressure probe instrumentation was used with radial and circumferential traverses after each blade row. The through-flow program used to provide sample results is based on a method of solution for axisymmetric and steady flow in axial turbomachines; it solves the complete radial equilibrium equation - acounting for enthalpy and entropy gradients and streamline curvature effects - in a specified number of stations ahead of and after the blade rows. An orthogonal curvilinear system of coordinates, having the meridional coordinates coincident with the generatrices of the flow stream surfaces, is used in the solution. Overall predicted efficiency is 89.1% of the measured results. T.M.

N82-17186# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
SURVEY ON DIFFUSION FACTORS AND PROFILE LOSSES
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 115-126 refs

Avail: NTIS HC A15/MF A01

Emphasis is placed upon the development of stage and blade design procedure that will replace the simple loss prediction techniques in use today. These techniques are difficult to apply to real machine design because extensive iterative hub-to-tip, blade-to-blade, and boundary-layer flow calculation is needed. Parametric studies with blade-to-blade flow and boundary layer calculation codes were examined which attempt to refine the diffusion factor concept and loss correlation at design as well as off-design compressor operation. The codes begin to demonstrate how the flow parameters (including Mach- and Re-number) and the details of blade geometry interact to produce performance characteristics. T.M.

N82-17188# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
END-WALL BOUNDARY LAYER CALCULATION METHODS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 137-150 refs

Avail: NTIS HC A15/MF A01

The end-wall boundary layer (EWBL) approach to secondary losses is based on the integration of the pitch-averaged three-dimensional boundary layers along the hub and tip walls, with extra assumptions for the blade force defect terms. From there an efficiency drop is calculated including secondary flow effects, as well as blockage. The method allows in principle for the influence of inlet blockage, clearance, axial gap, aspect ratio and other parameters to be included through their effect on the end-wall boundary layers. From the knowledge of the velocity profiles inside the boundary layers, the full radial variations of incidence and turning can be predicted by coupling a radial equilibrium calculation to the EWBL calculation. T.M.

N82-17189# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
CORRELATION FOR SECONDARY FLOWS AND CLEARANCE EFFECTS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 151-165 refs

Avail: NTIS HC A15/MF A01

It is concluded that correlations obtained from straight cascade data will at least provide correct trends for the effect of clearance in compressors. With cascade data, the effect of variation of blade circulation with span is not known. This will cause problems if spanwise distributed correction for losses and angle are to be considered. For turbine, it is well known that for secondary flow effect the loss level as obtained from cascade data may differ of an order of magnitude from the machine losses. This is linked most probably to the effect of relative motion when passing from nozzle to rotor or vice-versa. In compressors this effect tends to bring back the end-wall boundary layer to a more collateral state, and the difference might be somewhat less. T.M.

N82-17190# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
EFFECTS OF REYNOLDS NUMBER AND TURBULENCE LEVEL ON AXIAL CASCADE PERFORMANCE
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 164-170 refs

Avail: NTIS HC A15/MF A01

A semiempirical theory was developed which will predict the behavior of the shear layer across a laminar separation bubble. The method is proposed for two dimensional incompressible flow and is applicable down to short bubble bursting. The method can be used to predict the length of the laminar bubble, the bursting Reynolds number, and the development of the shear layer through the separated region. As such, it is a practical method for calculating the profile losses of axial compressor and turbine cascade in the presence of laminar separation bubbles. It can also be used to predict the abrupt leading edge stall associated with thin airfoil sections. The predictions made by the method are compared with the available experimental data. T.M.

N82-17191# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
SURVEY ON THE EFFECT OF BLADE SURFACE ROUGHNESS ON COMPRESSOR PERFORMANCE
In its Through Flow Calculation in Axial Turbomachines Oct. 1981 p 171-180 refs

Avail: NTIS HC A15/MF A01

Analysis of limited experimental data reveals that critical roughness Reynolds number of compressor blades manufactured with typical present day methods as forging/etching and electrochemical machining are around 90 and therefore very close to sand type roughness if roughness height is based on the largest peaks. Modern high pressure ratio engines suffer from blade surface roughness in the back stages of the compression system. Surface quality needed to keep the flow hydrodynamically smooth exceeds considerably the best present day quality achievable, thus limiting the potential efficiency gain at high Reynolds number flight conditions, i.e., essentially low level flight conditions. L.F.M.

N82-17192# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
PART SPAN DAMPER LOSS PREDICTION FOR TRANSONIC AXIAL FAN ROTORS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 181-183 refs

Avail: NTIS HC A15/MF A01

For off design conditions, the maximum loss due to the damper and region of influence at design point are calculated and these values are used as reference quantities for all off design calculations. The point of intersection of a constant throttle or area operating line through the design point with a speed line defines the reference point where the PSD loss is minimum. From this point the suction surface incidence at the damper location is determined from experimental data or off design analysis code. Then the damper maximum loss region of influence is calculated for any point on the speed line by taking the difference in suction surface incidence at that point and the reference incidence. To minimize damper loss, several things should be taken into consideration. Both approaches agree on the following: the damper should be as thin as possible so as to minimize the area influenced; the damper should be located as near to the hub as possible; work input should be minimized at the PSD location. Correlation of experimental results shows further that damper trailing and leading edge thickness should be as sharp as possible. L.F.M.

N82-17193# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
DEVIATION/TURNING ANGLE CORRELATIONS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 184-211 refs

Avail: NTIS HC A15/MF A01

In the past, compressor through flow solutions used substantial input from experimental measurements made in actual fan and compressor flow messages or in flows simulating real compressor conditions. For example, almost total reliance was placed on experimentally supported methods for estimation of fluid turning angles in individual blade rows. Compressor design is, as a result, heavily dependent on the quality of the experiment and data correlations associated with these methods. The three principal currently used prediction methods for flow turning angle were developed during the period 1945 to 1960. One of these methods directly predicts fluid turning angles in terms of cascade geometry and aerodynamic parameters. The others predict the exit flow deviation angle, defined as the angle between the average exit flow direction and the direction of a line tangent to the blade section camber line at the trailing edge. There has been no substantial modernization of these deviation/turning angle procedures since 1960, while during this time the methods have been widely applied to airfoil section profiles and in aerodynamic regimes far outside the limits suggested by the original derivations and data correlations. A discussion of these problems is presented. L.F.M.

N82-17194# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
AXIAL COMPRESSOR STALL AND SURGE
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 212-213 refs

Avail: NTIS HC A15/MF A01

The so called surge line evaluation is an extremely complex area, which deserves in itself full attention. The intention here was only to define the problem. The existing methods of prediction do not take the real physics of the flow into account, and cannot explain or consider or identify all the parameters of importance. They are however quick and useful for the range in which they have been calibrated, but are mostly not available in public literature. A more generalized use of the pseudoend wall boundary layer approach seems interesting. Satisfactory solutions will come however only from the logical approach of instability detection, second flow regime and system response characterization, for which solid elements are now in hand but require further development. L.F.M.

N82-17195# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
SUMMARY OF ANSWERS TO THE QUESTIONNAIRE
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 214-218 refs

Avail: NTIS HC A15/MF A01

To ascertain better the state of the art, a questionnaire bearing on particular points raised by the general survey paper of Hirsch was prepared and distributed to industry and research groups. Questions concerning compressor loss correlations, flow turning correlations, and secondary and clearance effects were asked. Answers were received from six countries and a summary is presented. L.F.M.

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without imposing restrictive conditions on the engagement geometry. The design of a Doppler radar system for measuring the miss-distance is considered. The system makes use of the Doppler frequency shift due to the relative velocity between projectile and target to determine the magnitude of the miss-distance. The practical realization of the system measuring concepts is discussed, taking into account aspects of target installation, the antennae, and the ground equipment. The maximum miss-distance which may be determined depends on the size of the projectile. Typical maximum values are 4 m for a 30 mm shell, 11 m for a 114 mm shell, and 15 m for a guided weapon. G.R.

A82-18906 # **Sanctuary radar.** F. L. Fleming (Technology Service Corp., Santa Monica, CA) and N. J. Willis (U.S. Defense Advanced Research Projects Agency, Arlington, VA). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 103-108. Army-USAF-supported research.

This paper describes the Sanctuary bistatic radar test bed and fundamental technical issues addressed in the test program. It outlines the choice of waveform and digital signal processor configuration, which performs both Doppler filtering and pulse compression in the frequency domain. It explains clutter suppression techniques, including those involving real-time software control of the digital processor. Finally, it summarizes flight test objectives and results obtained during initial system tests with the airborne transmitter. (Author)

A82-18908 **Recent developments in military telemetry.** R. G. A. Marzolini (EMI Electronics, Ltd., Feltham, Middx., England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 123-128.

Developments regarding UK guided weapon telemetry systems following World War II are examined. Analog systems operating in the frequency band from 430 to 450 MHz were replaced in the 1960's by the Type 4650 Variant I and Variant II systems. In the early 1970's, due to the expansion of private mobile radio services, military telemetry moved to new allocations in the frequency band from 1430 to 1450 MHz. The change in frequency operation is to be completed by Jan. 1, 1981. This change in carrier frequency affected the systems which would be allowed to operate in the new band, and one resulting development was the Type 1440 (PAM/FM/FM) system. In parallel with this carrier frequency change the development of digital telemetry in the form of the Type 109 (PCM/FM) system commenced. Attention is given to details regarding carrier frequency, FM transmitters, PCM encoders, standards, and a flight proving trial. G.R.

A82-18911 **Microwave communications to remotely piloted vehicles.** M. R. B. Dunsmore and S. E. Gibbs (Royal Signals and Radar Establishment, Malvern, Worcs., England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 141-148.

Remotely piloted vehicles (RPVs) rely on two-way communication links to return data from their surveillance sensors to their ground control stations and to receive data for monitor and control operations. The requirements of a data link are examined, and a data link design for meeting these requirements is discussed. It is found that RPV data links are constrained to operate in or above the microwave frequency bands, typically G or J bands. The information (video) bandwidth is considered along with channel bandwidths, the operating range, antenna patterns, receiver sensitivity, and transmitter power. The vulnerability of RPV data links to electronic countermeasures (ECM) is evaluated, taking into account also remotely piloted helicopters. G.R.

A82-18914 # **L-band power generation in the General Electric solid-state radar.** G. B. Sleeper (General Electric Co., Syracuse, NY). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 199-205.

A solid-state, L-band air defense radar is discussed. The considered radar is entirely computer controlled. By handling the energy management problem with a computer in real time, it is possible to exploit fully the high-duty-cycle capability of solid-state power generation. An approach combining computer and solid-state device technologies provides a number of advantages related to high reliability, long operational life, graceful degradation, and low maintenance costs. Attention is given to the array configuration, aspects of array phase calibration, row transmitters, the array transmitter, the power modules, the DC power supply transmit/receive switching, and phase shifting for both transmit and receive. G.R.

A82-18917 **R.F. calibrators for Doppler radars.** T. Billing and P. A. R. Holder (EMI Electronics, Ltd., Wells, Somerset, England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 245-250. Research supported by the Ministry of Defence (Procurement Executive).

This paper deals with the problem of achieving reliable calibration of Doppler radars. Calibration with a simulator at constant range is examined for two practical cases: in a radar trials situation, where the simulator is placed at a distance for a line-of-sight type calibration; and in the laboratory, where a simulator is connected directly to the radar and where the range delay is simulated. (Author)

A82-18920 # **Automatic controlled terrain following flights.** R. Rode and A. Hessel (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 275-280.

Three low-level flying modes are named: terrain-following, terrain-avoidance, and terrain-clearance. Because the terrain avoidance mode is difficult under bad weather conditions and because the terrain-clearance mode is unacceptable with regard to vulnerability, the terrain-following mode is regarded as an acceptable compromise. Block diagrams describing this system are given. It is noted that the system is based on a scanning forward looking radar which, together with other sensors, operates in a closed loop with an automatic flight control system. The radar scans the terrain ahead of the aircraft; the computer then calculates a vertical acceleration based on this information which is then used by the autopilot and flight control system to keep the aircraft on its required flight path. C.R.

A82-18934 # **Octave bandwidth dual polarized antenna.** C. Nicolai, R. Scarpetta, and P. Russo (Selenia S.p.A., Pomezia, Italy). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 417-421.

It is noted that the requirements in the design of ECM antennas become harder to meet for the lower operating microwave frequency band (S or L). A crossed dipole in the short backfire configuration with high performance over more than a 2:1 frequency band is described. Wideband operation is achieved by a proper design of the dipoles and cavity geometry and of the feeding baluns and sleeves. The dipole length and the distance from the cavity are, respectively, about 1/2 and 1/4 of the wavelength at the center frequency. It is noted that radiation patterns optimization and control are possible by varying the sleeves and the back cavity geometry. Good amplitude and phase pattern optimization is achieved with the circular sleeves geometry and the polygonal cavity geometry. C.R.

A82-18936 # **Microwave systems for radar guided missiles.** M. F. Godfrey (Marconi Space and Defence Systems, Ltd., Stanmore, Middx., England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 433-438.

The importance of the microwave components in radar homing heads is stressed, noting that it is these components which condition the radar signal for the signal-processing unit. The difference between the coherent and incoherent radars used in guided weapons is discussed. Attention is also given to semiactive and active incoherent radars. It is noted that a coherent transmitter must provide mean powers of up to 1 kW, depending on the application, at duty ratios of up to 50% and with pulse repetition rates which may be as high as 500 kHz. The dc to microwave efficiency should be more than 20%. Incoherent transmitters must provide peak powers above 50 kW at duty ratios of 0.1%. C.R.

A82-18937 # **A terminal guidance simulator for evaluation of millimeter wave seekers.** A. J. Witsmeer and K. L. Wismer (Boeing Aerospace Co., Seattle, WA). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 445-451.

A theoretical and physical description is given of a simulator for evaluating passive terminal guidance seekers operating in the millimeter region 10-100 GHz. Attention is also given to the expansion of the present facility into the active regime. It is noted that the chamber may be the only one of its kind in the world. A feature that makes it unique is the use of aluminum foil to reflect the excess microwave energy out of the room through a skylight. In effect, this makes the walls appear cold like the sky background so that the seeker sees only the array with its picture of the target scene. C.R.

A82-18940 # **Airborne measurements with a sensitive high resolution 90 GHz radiometer.** K. Grüner and B. Aumiller (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Hochfrequenztechnik, Oberpfaffenhofen, West Germany). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 473-480.

Design criteria and realized configurations of sensitive, high-resolution airborne 90 GHz radiometer used in low-altitude flights are described. Selected results of the first test measurements are given. The receiver front end comprises an antenna scalar feed horn and a GaAs single-ended Schottky mixer with an integrated first-stage FET-IF-amplifier mounted in an evacuated compartment and cooled to 23 K by a two-stage temperature-controlled helium refrigerator. Among the characteristics are an RF input frequency of 83.9-85.1 and 90.9-92.1 GHz, an IF band of 2.9-4.1 GHz, and a scan angle of plus or minus 14.5 deg. C.R.

A82-18942 # **A study of potentially low cost millimetre-wave radiometric sensors.** S. J. Nightingale and R. N. Bates (Philips Research Laboratories, Redhill, Surrey, England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 486-491. 7 refs.

Some of the design considerations for a radiometric sensor are examined with a view to developing a compact, lightweight unit which would be cheap to produce. The construction and performance of a 35 GHz Dicke radiometer are described. The r.f. components are made with 'E' plane circuitry, which makes it possible to realize a variety of different transmission structures, for example, finline, microstrip, and coplanar waveguide. It is noted that the r.f. and i.f. circuit techniques discussed here can also be used to make similar units operating at frequencies up to at least 100 GHz. C.R.

A82-18943 **Radiometric measurements at 80 GHz.** S. E. Millard, K. O. Rossiter, and G. R. Selby (EMI Electronics, Ltd., Wells, Somerset, England). In: Military microwaves '80; Proceedings of the Second Conference, London, England, October 22-24, 1980. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1981, p. 492-497. Research sponsored by the EMI Electronics, Ltd. and Royal Signals and Radar Establishment.

The radiometer system employs the Dicke-switch principle with a 50% duty ratio but also incorporates an additional reference load which can replace the antenna for calibration purposes. Each load is maintained at a certain temperature by immersion in a dewar together with either ice (273 K) or solid CO2 (195 K). It is noted that, in addition, the overall system can be calibrated and the gain checked by fitting small 'black body' cones filled with either ice or solid CO2 over the antenna feed. The measurements made at 81 GHz show acceptable contrasts between a variety of metal targets and characteristic backgrounds for various weather conditions. To the extent that they have been analyzed to date, the measurements confirm that a center frequency in the range 75-90 GHz is acceptable for all-weather operation. They also emphasize the need for both vertical and horizontal polarization measurements to discriminate between metallic and wet, nonmetallic surfaces. C.R.

A82-18975 † **Airport radar systems (Radiolokatsionnye sistemy aeroportov).** L. T. Perevezentsev, A. V. Zelenkov, and V. N. Ogarkov. Moscow, Izdatel'stvo Transport, 1981. 384 p. 27 refs. In Russian.

The design principles of ground-based radar systems for civil aviation are presented along with techniques for implementing these principles and structural and operational characteristics of airport radar systems. Consideration is given to transmitter, receiver, and feed design, and to MTI systems, the primary processing of radar data, the interpretation and processing of secondary radar data, and radar display techniques. B.J.

A82-18996 † **Aircraft electrical equipment - Design and operation (Elektrooborudovanie samoletov - Ustroistvo i ekspluatatsiia).** A. P. Barvinskii and F. G. Kozlova. Moscow, Izdatel'stvo Transport, 1981. 280 p. In Russian.

Design principles and circuit designs are presented for a variety of aircraft electrical systems. Particular consideration is given to ac and dc generators in aircraft power supply systems, and to the electromechanical drive equipment. Various electrical control systems are also examined, including engine starting, fuel control, antiicing, lighting, and fire extinguishing. B.J.

A82-19001 **Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports (Die Luftrettung: Ergebnisse, Analysen, Entwicklungen; Internationaler Luftrettungs-Kongress, 1st, Munich, West Germany, September 16-19, 1980, Berichte).** Congress sponsored by the Allgemeiner Deutscher Automobil-Club. Edited by H. H. Atrott. Munich, Allgemeiner Deutscher Automobil-Club, 1981. 503 p. In German and English.

A survey of aeromedical evacuation services throughout the world is provided, taking into account conditions in Switzerland, Austria, France, Norway, Great Britain, Italy, West Germany, Belgium, Sweden, Spain, the United States, Australia, East Africa, South Africa, Argentina, Chile, New Zealand, and Bahrain. Subjects related to organization, legal and financial bases are investigated, giving attention to basic guidelines for a helicopter ambulance service, an air emergency service, a universal system for the identification of emergency vehicles, marketing the hospital-based helicopter system in a free enterprise environment, and limitations and developments of commercial schedule airline flights for the carriage of invalid passengers. Other topics explored are related to aviation medicine, flight guidance and control systems, the training of aeromedical evacuation personnel, and medical and technical requirements for aircraft and equipment. G.R.

A82-19002 **The marketing, organisation and financing of aeromedical evacuation by a motoring organisation.** A. J. Whitaker (British Automobile Association, Basingstoke, Hants., England). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 71, 72.

The features and effectiveness of a British automotive club aeromedical insurance plan for travellers in Europe, North Africa, and Turkey are described. The plan is sold through banks, travel agents, and service centers, and the service is provided by an amubulance organization with an aeromedical wing. A central communications base can dispatch emergency air services for transport back to Britain in case of accident or illness, using either

péenne ETW - Etat actuel). J. P. Morel (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Association Aéronautique et Astronomique de France, Colloque d'Aérodynamique Appliquée, 18th, Poitiers, France, Nov. 18-20, 1981.) ONERA, TP* no. 1981-121, 1981. 24 p. 5 refs. In French.

An interim report on the design for a European Transonic Wind Tunnel, being built by the cooperative efforts of West Germany, Britain, and the Low Countries is presented, and details of the partially completed prototype wind tunnel are provided. The ETW will be a cryogenic, nitrogen gas installation for examining flows at high Reynolds numbers, and consultations are continuing with NASA on the cryogenic technology. The full test channel will have a 2.4 x 2 sq m cross section, with a pressure variance between 1.25-4.5 bars. Temperatures will range from 120-168 K at Mach numbers up to 1.7, and equipment altering the incidence angle of test models at a rate of four deg/sec is intended. A pilot ETW is under construction, with a cross-section of 0.27-0.23 m, and is being used to verify the aerodynamic performance of the flow circuit, the responses to Mach number, pressure, and temperature, and the control circuits. M.S.K.

A82-19738 # **Aerodynamics of a transport aircraft-type wing-fuselage assembly (Aérodynamique d'un ensemble voilure-fuselage du type 'Avion de transport').** V. Schmitt (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 18th, Poitiers, France, Nov. 18-20, 1981.) ONERA, TP* no. 1981-122, 1981. 24 p. 19 refs. In French.

This study, carried out at ONERA, is based on the DFVLR-F4 wing-body combination. The 1/38 model is formed by a 9.5 aspect ratio transonic wing and an Airbus A 310 fuselage. After a description of the F4 wing geometrical characteristics, main experimental results obtained in the S2MA wind tunnel are discussed. Both wing-fuselage interferences and viscous effects, which are important on the wing due to a high rear loading, are investigated. In order to do that three-dimensional calculations are performed; an attempt is made to find their limitations. (Author)

A82-19740 # **Three-dimensional calculation of the flow in helicopter air intakes (Calculs tridimensionnels de l'écoulement dans les prises d'air d'hélicoptères).** B. Boizard (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Association Aéronautique et Astronautique de France, Colloque d'Aérodynamique Appliquée, 18th, Poitiers, France, Nov. 18-20, 1981.) ONERA, TP* no. 1981-124, 1981. 14 p. In French. Research supported by the Direction des Recherches, Etudes et Techniques.

The results of an ONERA-initiated investigation to optimize the efficiency of helicopter air intakes and minimize the aerodynamic drag are reported. A method of singularities was used to study the internal flow in the air intakes, with the flow considered as incompressible and the air as an ideal fluid. The walls of the intake were discretized into quadrilateral facets for solution of a series of linear equations in a computer. The velocity fields induced by the facets were obtained for the intensities of the calculated doublets. The air intake during hovering and acceleration are modeled for two existing aircraft, and the necessity of accounting for viscous effects in future programs is indicated. M.S.K.

A82-19784 * # **Control law development for a close-coupled canard, relaxed static stability fighter.** R. W. Klein, M. Lapins, R. P. Martorella, and M. Sturm (Grumman Aerospace Corp., Bethpage, NY). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0180.* 20 p. Contract No. NAS1-16636.

The performance benefits to be gained from relaxed static stability (RSS) are illustrated for $M = 0.9$ and $M = 2.0$ flight conditions. The longitudinal, directional, and lateral control system structure is developed. The effect of static margin, bandwidth, and canard-wing interaction on canard rate requirements is analyzed. Control and maneuver limiter functions are developed and implemented about all three axes; simulation results strikingly demonstrate the concomitant improvement in energy management and improved resistance to departure and spin. C.R.

A82-19786 * # **An analytical technique for the analysis of airplane spin entry and recovery.** L. W. Taylor, Jr. and G. K. Miller, Jr. (NASA, Langley Research Center, Flight Dynamics and Control Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0243.* 9 p. 10 refs.

The dynamic equations of motion for a spinning airplane are simplified to facilitate the analysis of spin entry and recovery maneuvers. Solutions of a nonlinear, first order equation for spin rate enable calculation of spin entry and recovery times and control required for recovery. The analysis is applied to a light airplane for which both aerodynamic data, rotory balance wind tunnel tests, and spin flight test data have been obtained. A comparison of predicted and actual transient spin responses is made which supports the validity of the analytical approach taken but which also illustrates the difficulty in obtaining accurate aerodynamic data for spinning airplanes. Certain normalized parameters of the reduced state spin equation suggest criteria for assessing the transient spin characteristics of light airplanes. (Author)

A82-19791 # **The sooting tendency of fuels containing polycyclic aromatics in a research combustor.** D. W. Naegeli, L. G. Dodge, and C. A. Moses (Southwest Research Institute, San Antonio, TX). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0299.* 11 p. 21 refs.

An investigation regarding soot formation has been conducted for a variety of jet fuels, taking into account a wide range of combustor conditions covering the operating envelopes of many gas turbine engines. The results demonstrate that the dominant soot formation mechanisms in gas turbine engines are dependent on operating conditions. There are evidently a number of competing soot formation and oxidation steps whose relative importance varies with inlet air temperature, reference velocity, and fuel/air ratio. Under some operating conditions the sooting tendency is significantly affected by polycyclic aromatics including tetralin, but the H/C ratio is the principal correlating parameter. At high power conditions where soot formation is of greatest concern, the fuel/air ratio of most engines is high (0.02), and there is little sensitivity to polycyclics. G.R.

A82-19796 * # **Experimental studies of the Eppler 61 airfoil at low Reynolds numbers.** T. F. Burns and T. J. Mueller (Notre Dame, University, Notre Dame, IN). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0345.* 12 p. 15 refs. Research sponsored by the University of Notre Dame; Grant No. NsG-1419.

The results of an experimental study to document the effects of separation and transition on the performance of an airfoil designed for low Reynolds number operation are presented. Lift, drag and flow visualization data were obtained for the Eppler 61 airfoil section for chord Reynolds numbers from about 30,000 to over 200,000. Smoke flow visualization was employed to document the boundary layer behavior and was correlated with the Eppler airfoil design and analysis computer program. Laminar separation, transition and turbulent reattachment had significant effects on the performance of this airfoil. (Author)

A82-19797 * # **Numerical solution of three-dimensional unsteady transonic flow over wings including inviscid/viscous interactions.** D. P. Rizzetta and C. J. Borland (Boeing Military Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0352.* 37 p. 30 refs. Contract No. NAS2-10762.

A method is presented for computing the unsteady three-dimensional transonic flowfield about twin wings of arbitrary planform and section geometry including the effects of inviscid/viscous interaction. Dominant effects of the shock-boundary-layer interaction are accounted for by a simple empirically defined model, while viscous regions adjacent to the wing surface and along the trailing wake are described by a set of integral equations appropriate for two-dimensional turbulent flows. The validity of the proposed method is verified by comparison with steady three-dimensional experimental data and a solution of more exact equations for a typical transport wing configuration. V.L.

A82-19798 * # **Unsteady lifting-line theory with applications.** A. R. Ahmadi (Bolt Beranek and Newman, Inc., Cambridge, MA) and S. E. Widnall (MIT, Cambridge, MA). *American Institute of*

Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0354. 21 p. 32 refs. Research supported by the Bolt Beranek and Newman, Inc.; Grant No. NGR-22-009-818.

Unsteady lifting-line theory is developed for a flexible unswept wing of large aspect ratio oscillating at low frequency in inviscid incompressible flow. The theory is formulated in terms of the acceleration potential and treated by the method of matched asymptotic expansions. The wing displacements are prescribed and the pressure field, airloads, and unsteady induced downwash are obtained in closed form. Sample numerical calculations are presented. The present work identifies and resolves errors in the unsteady lifting-line theory of James and points out a limitation in that of Van Holten. Comparison of the results of Reissner's approximate unsteady lifting-surface theory with those of the present work shows favorable agreement. The present work thus provides some formal justification for Reissner's ad hoc theory. For engineering purposes, the region of applicability of the theory in the reduced frequency-aspect ratio domain is identified approximately and found to cover most cases of practical interest. (Author)

A82-19801 # **Real gas flows over complex geometries at moderate angles of attack.** S. Swaminathan, C. H. Lewis (Virginia Polytechnic Institute and State University, Blacksburg, VA), and M. D. Kim. *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0392.* 22 p. 12 refs.

Numerical simulation of supersonic and hypersonic flows over arbitrary geometries at moderate angles of attack is presented in this paper. The different geometries considered for analysis include a slab delta wing, a sphere-cone-cylinder-flare, a blunt-nosed inlet and a 7-degree half-angle sphere-cone. The three-dimensional flowfields over these geometries are analyzed by a parabolized Navier-Stokes code (HYTAC) and a new viscous shock-layer code (VSLET), and the results are compared. Both laminar and turbulent flowfield results for both perfect gas and equilibrium air are presented. In general the surface pressure distributions are in good agreement whereas the heat-transfer results differ depending on the differencing scheme used in the calculation of gradients and turbulent modelling. Aerodynamic force and moment coefficients are presented for some typical cases. Computing times for various test cases are presented. (Author)

A82-19810 † **Aerodynamic characteristics of waveriders at subsonic flight speeds (Aerodinamicheskie kharakteristiki Lambda-kryl'ev na dozvukovykh skorostiakh poleta).** V. I. Voronin and A. I. Shvets. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Nov.-Dec. 1981, p. 104-109. 10 refs. In Russian.

Theoretical and experimental results are presented on the aerodynamic characteristics of two series of waverider models, differing in dihedral angle and sweep angle. The method of discrete vortices was used to analyze the characteristics of thin triangular-platform waveriders. Theoretical results were compared with experimental data on thin waveriders with a relative thickness up to 3%; wind tunnel tests were carried out in the 0.4-0.8 Mach number range. B.J.

A82-19813 † **Analysis of an ideal-fluid flow past a finite-thickness wing (Raschet obtekaniia kryla konechnoi tolshchiny ideal'noi zhidkost'iu).** A. A. Zaitsev and A. D. Khamzaev. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Nov.-Dec. 1981, p. 124-131. 12 refs. In Russian.

A numerical analysis of potential flow past a finite-span wing is carried out using a piecewise-linear approximation of the unknown functions with respect to wing span. In the nonlinear problem the vortex sheet is represented as vortex threads, while in the linear problem it is represented as vortex threads and as a vortex surface. An aerodynamic analysis of swept-wings of finite thickness is presented, and theoretical results are compared with experimental data. B.J.

A82-19814 † **The design of compact asymmetric maximum-thrust nozzles for a given lift force (O postroenii kompaktnykh nesimmetrichnykh sopl maksimal'noi tiagi pri zadannoi pod'emnoi sile).** A. I. Rylov. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Nov.-Dec. 1981, p. 132-136. 7 refs. In Russian.

Kraiko's (1979) indeterminate-control-contour method is used to solve the variational design problem for an asymmetric supersonic plane maximum-thrust nozzle for a given lift force and given size constraints. It is shown that the present problem is equivalent to the maximum thrust problem (with the absence of the lift-force constraint) in a coordinate system that differs from the original system by a certain angle of rotation. Numerical calculations are presented which illustrate the influence of the lift force on nozzle geometry and thrust. B.J.

A82-19868 **X-band vs C-band aircraft radar - The relative effects of beamwidth and attenuation in severe storm situations.** P. H. Hildebrand, R. A. Oye, and R. E. Carbone (National Center for Atmospheric Research, Boulder, CO). *Journal of Applied Meteorology,* vol. 20, Nov. 1981, p. 1353-1361. 21 refs. U.S. Bureau of Reclamation Contract No. 7-07-83-V001; NSF Grant No. ATM-78-27420.

A simulation of X-band and C-band radar is given, with consideration of the effects of attenuation and beamwidth on measurements of radar equivalent reflectivity factor. Two tornadic storms were examined, to determine the ability of radar to adequately show a safe path through a storm. Historical data were acquired and attenuated for the radar wavelength chosen, filtered in azimuth, elevation, and range desired according to the radar beamwidth and pulse depth desired, and filtered in threshold on the basis of received power in order to approximate the simulated radar sensitivity. It was found that X-band radar can provide incorrect information in severe convective storms, while C-band radar is more accurate in severe storm penetration, especially with sampling at 1/3-1/4 beamwidth intervals. The results are noted to hold significance for both operational and research airborne radar use. M.S.K.

A82-19928 † **Automated calculation of the stressed state of shell systems under asymmetrical mechanical and thermal loading (Ob avtomatizatsii rascheta napriazhennogo sostoianiia obolochechnykh sistem pri nesimmetrichnykh silovykh i teplovykh vozdeistviiakh).** Ia. M. Grigorenko, G. I. Genkin, N. D. Draigor, E. T. Fedorova, and V. N. Khoroshilov (Akademiia Nauk Ukrainskoi SSR, Institut Mekhaniki, Kiev, Ukrainian SSR). *Prikladnaia Mekhanika,* vol. 17, Dec. 1981, p. 49-56. In Russian.

Problems related to the computer calculation of the strength of structural elements of aircraft engines are presented. The engines are considered to be elastic systems, composed of various shells of revolution, which are under the effects of non-axisymmetrical mechanical and thermal loads, as well as boundary forces and moments. The calculated values are found to be in good agreement with experimental results. J.F.

A82-19947 **Consequences of American airline deregulation Legislative theory in a concrete example (Auswirkungen der amerikanischen Airline Deregulations - Gesetzgebungslehre an einem konkreten Beispiel).** R. H. Weber. *Zeitschrift für Luft- und Weltraumrecht,* vol. 30, Dec. 1981, p. 333-348. 52 refs. In German.

The Airline Deregulation Act of 1978 is discussed in terms of its impact on American and international air commerce. Major advantages and disadvantages are presented, including a lower cost of flying for the consumer and efficient and profitable air route structures on the one hand and the reduction of safety standards and the creation of operational and financial instability for airlines on the other. Consequences of deregulation in the American market include the establishment of a tariff, a reduction of service for smaller airports, and an increase in small commuter aircraft which run a greater accident risk, especially at take-off and landing. The impact of the tariff on international air traffic is discussed, and a comprehensive evaluation of the Deregulation Act is given. It is concluded that innovation in the airline industry will play a larger role due to increased competition resulting from the deregulation. D.L.G.

A82-19958 # **Subsonic and transonic roll damping measurements on Basic Finner.** H. S. Murthy (National Aeronautical Laboratory, Bangalore, India). *Journal of Spacecraft and Rockets,* data was evaluated for deviation from a preset flight path and for the number of fix points contained in photographs from forward and downward looking cameras. The terrain following subsystem ensures a safe flightpath down to 200 ft altitude, and was evaluated by photographs of the ground and by radar altimeter data. The instrumentation monitoring routing is described, and modifications to correct deficiencies are indicated. M.S.K.

A82-20761 **Design, development and flight testing of a jet powered sailplane.** B. S. Smith (Caproni Vizzola Costruzioni Aeronautiche S.p.A., Vizzola Ticino, Italy). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 14-1 to 14-17. 15 refs.

The design and development of the tadpole-shaped, turbojet powered A21 powered glider are discussed. The necessity of broadening the fuselage to house the jet led to the use of two wheels on the central core structure, which furnishes greater runway handling stability. An aspect ratio of 25.65 is used for the all-metal wings, and an engine 0.3 m in diameter, 0.61 m long, and weighing 30 kg was installed to provide take-off thrusts of 100 kg. A bifurcated exhaust was fitted to avoid having the exhaust impinge on the tail section, and the engine compartment was lined with steel and titanium as a heat limiter. The plane has been flown at speeds up to 190 knots at altitudes exceeding 33,000 ft without experiencing flutter. M.S.K.

A82-20762 **Performance flight test evaluation of the Ball-Bartoe JW-1 Jetwing STOL research aircraft.** R. D. Kimberlin (Tennessee, University, Tullahoma, TN). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 16-1 to 16-20.

The initial steps of the flight test program for the Ball-Bartoe JW-1 Jetwing aircraft are reported. The jet wing vents all engine air through the front of the wing and ejects it over the top of the wing through a slot nozzle which extends 70% of the full wing span. A Coanda flap is mounted at the trailing edge of the blown wing section, and a smaller wing is mounted above the slot nozzle to provide thrust augmentation. The initial series of tests, which followed 78 previous flight tests, comprised pilot familiarization flights, airspeed calibration, thrust calibration, and V-gamma maps. Sawtooth climbs were found to facilitate data collection due to longitudinal instability in level acceleration, and thrust losses amounting to 15-20% were experienced from the ducting. Further design iteration to reduce the ducting thrust losses is indicated. M.S.K.

A82-20763 * **Analysis of flight test measurements in ground effect.** E. K. Parks (Arizona, University, Tucson, AZ) and R. C. Wingrove (NASA, Ames Research Center, Aircraft Guidance and Navigation Branch, Moffett Field, CA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 17-1 to 17-26. 13 refs.

Three sources of errors, introduced into the air-data measurements of altitude and airspeed as a result of ground proximity, are evaluated. It is shown that the primary error results from ground constraint of the wing lifting pattern. Smaller errors result from constraint of the flow over the fuselage and of the engine exhaust. Equations are derived to provide corrections for the three error contributions. The equations are general and can be applied to airplanes of different geometries operating in different conditions. Applications illustrating different types of flight operations (takeoff and landing) are presented using CV-990 data. Applications illustrating the effect of different static orifice locations (fuselage and nose-boom) are presented with YC-15 data. Finally, an application to trajectory reconstruction is illustrated using DC-10 data. (Author)

A82-20764 **A study of the suitability of the all fiberglass XV-11A aircraft for fuel efficient general aviation flight research.** G. Bennett (Mississippi State University, Mississippi State, MS). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 18-1 to 18-15. 8 refs.

The impact of rapidly rising fuel prices upon future general aviation aircraft requirements is explored. The current configuration of the fiberglass XV-11A aircraft is presented and it is shown that the aircraft can become a cost effective testbed for fuel efficient general aviation aircraft configurations. Several suitable research tasks for the aircraft are defined. A low cost method to produce master wing molds is proposed. (Author)

A82-20765 **A comprehensive flight test flyover noise program.** J. W. Vogel (Lockheed-California Co., Flight Analysis Dept., Palmdale, CA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 19-1 to 19-19.

Preliminary results from a program to develop noise prediction methods from static tests which are applicable to flyover noise levels are presented. The program was developed to provide a data base for future certification, customer requirements, and engine modifications, and involved a Lockheed L-1011 with a Rolls-Royce RB.211 engine. Noise level modifications were observed to be possible by altering the power plant components, the airframe, the effects of the jet-flow on the flaps, and forward velocity. Flyovers were performed over microphones on the ground at heights of 300 and 600 feet at various speeds and with the flaps in varying positions, taking into consideration different configurations of climb or descent. Engine noise was found to dominate in the rear arc while airframe noises were dominant in the forward arc, and either flap or landing gear deployment enhanced the sound levels by up to 8 dB. M.S.K.

A82-20766 **Size reduction flight test airborne data systems.** J. W. Gierer (McDonnell Aircraft Co., St. Louis, MO). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 20-1 to 20-7.

A redesign of flight test data gathering systems to fit into the removable avionics areas of the F-18 aircraft is outlined. The use of low-power digital data recorders offers a size reduction of 2.2:1, with connections being accomplished by means of aircraft style connectors, lowering the number of connectors, and multiplexing where possible. A system design is presented which features subsystems for local and remote control panels, 8 MHz bandwidth helical scan recording on each channel, and time division multiplexing. Other aspects include a 28 V dc transformer rectifier, electronic packaged video, film, flutter excitation, and signal conditioning equipment, a 40 W transmitter, and low-power ICs. The system is intended for use on eight of the nine test F-18 aircraft. M.S.K.

A82-20767 **Data systems organization - A change for the better.** R. D. Samuelson (McDonnell Aircraft Co., St. Louis, MO). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980.
Lancaster, CA, Society of Flight Test Engineers, 1980, p. 21-1 to 21-7.

The implementation of a data systems organization at McDonnell Aircraft is described in terms of the project and departmental bases for the F-15 program. Key objectives of the flight test reorganization comprised strengthened control over data and instrumentation programs, combination of data and instrumentation operations to broaden individual responsibilities and increase efficiency, manage the data system development and the test support activities separately, combine data and instrumentation design activities, and combine supporting laboratories and supply operations where feasible. The data systems were divided into a design and development branch, an operations branch, and a processing and support branch, with respective subsections. The system carried through to F-18 development and resulted in a reduction of 20% in total expenditures. M.S.K.

A82-20768 **Simulator data test instrumentation - Flight test challenge of the eighties.** W. L. Curtice, III (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 22-1 to 22-22.

The development of a Simulator Data Test Instrumentation System (SDTIS) to compare flight test data with results from simulator tests is examined. The SDTIS features 180 channels of digital or analog signal data, TV camera, audio from voice recordings, in-field automatic data reduction and analysis. The problem of matching appropriate cues in response to pilot control actions in the simulator are explored, including the time of aircraft response. The SDTIS allows the matching of the simulator response data regarding time, magnitude, and accuracy against flight data from the aircraft which is simulated. The simulator signals recorded comprise analog signals, digital signals, motion sensors, a g-suit pressure sensor, external-follow-up sensors, control force sensors, and TV cameras. All signals are formatted through a data encoder/decoder, and the necessity for maintaining up-to-date flight test data bases for simulator fidelity measurements is stressed. M.S.K.

A82-20769 **The Boeing Flight Test Data System 1980.** G. J. Zanatta (Boeing Commercial Airplane Co., Seattle, WA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 23-1 to 23-15.

The Boeing Flight Test Data System is reviewed, with particular attention to the testing of the 757/767 aircraft. The System provides calibration, conditioning, monitoring, recording, extraction, analysis, manipulation, and reporting of data from aircraft tests. The data gathering system is based on pulse code modulation technology, with data routing and switching allowing up to 800 samples/sec. The airborne data analysis and monitor system is outlined, as is the ground analysis, telemetry analysis, and data processing ground stations. The interactive mainframe data base provides access for software users for data base applications, test data processing, and scientific programs. Provisions are made for floppy disk storage for on-board comparisons. The interactive process of engineer-to-computer eliminates manual data searches or searches for test data requirements. M.S.K.

A82-20770 **Instrumentation remote 'mini' ground station.** J. Nixon (Boeing Commercial Airplane Co., Seattle, WA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 24-1 to 24-7.

The methods of decentralizing the data processing for individual, remote aircraft testing at Boeing, and still making the central processing station available to the instrumentation engineer are described. A preflight instrumentation package is developed before testing, checked, and placed on-line with a ready signal to the central processing computer via a remote terminal CRT. The ready response yields a return of a mylar tape to program the ROMs for data acquisition, thus eliminating any ground traffic for flight test information materials. The system can operate from anywhere a modem system can be used, and it is noted that three systems are intended as mobile units, for carriage to areas where remote access is required. M.S.K.

A82-20771 **Color graphics based real-time telemetry processing system.** T. M. Randall (Lockheed-Georgia Co., Engineering Data Systems Dept., Marietta, GA). In: Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980. Lancaster, CA, Society of Flight Test Engineers, 1980, p. 25-1 to 25-15.

Features of the Lockheed real-time telemetry data processing system for monitoring flight test data acquisition and performing interactive analyses of test results are detailed. All calibration, correction, and conversion to engineering units are performed by the on-board PCM acquisition system, and the main man/machine interface on the ground is a raster scan color graphics display terminal. A scrolled time history format has been developed for use in the testing of the stretch C-141B, and data from tests is subject to analysis two to three minutes after test completion. The system eliminates trial-and-error data acquisition and piecemeal data processing, resulting in increased efficiency and attendant lowered costs, provided that appropriate software is available to utilize the system. M.S.K.

A82-20792 * # **Flow visualization using a computerized data acquisition system.** R. Gallington and G. Sisson (U.S. Air Force Academy, Colorado Springs, CO). In: International Symposium on Flow Visualization, Bochum, West Germany, September 9-12, 1980, Preprints of Contributed Papers. Bochum, West Germany, Ruhr-Universität Bochum, 1981, p. 134-141. 5 refs. NASA-supported research.

A computer-driven traversing mechanism combined with mass data storage, data reduction programs, and general-purpose graphics programs permits a visualization of complex flows. A unique seven-hole probe is used which permits reasonably accurate measurements of all average flow properties if the local flow angle does not exceed 80 degrees. A description is given of the wake of a lifting canard surface as this wake passes over a wing. The flow includes concentrated and dissipating vortices, large regions of reduced total pressure, and local flow angles up to 60 deg. All these features can be clearly seen and accurately located in the graphical output. C.R.

A82-20803 # **Visualization of flow separation and separated flows with the aid of hydrogen bubbles.** H. Bippes (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Experimentelle Strömungsmechanik, Göttingen, West Germany). In: International Symposium on Flow Visualization, Bochum, West Germany, September 9-12, 1980, Preprints of Contributed Papers. Bochum, West Germany, Ruhr-Universität Bochum, 1981, p. 225-230.

Experiments using the hydrogen bubble technique to investigate flow separation and separated flows on inclined wings and bodies are reported. The hydrogen-producing cathode was displaced until a location of interest can be found. The stability and the decay of trailing edge vortices shed from the tips of a rectangular wing at incidence was studied, and the flow was found to separate close to the point of maximum thickness. An axial velocity component was also observed, with a velocity close to the wing that was larger than the velocity of the oncoming flow. In a study of slender bodies the separation of the counter-rotating vortex pair became unstable, and at larger angles of incidence the lifting up of the vortex moved upstream, and another vortex layer separated downstream. On slender wings, the vortex breakdown manifested in a sudden burst. M.S.K.

A82-20811 # **Visualization of laminar separation by oil film method.** T. Ishihara, T. Kobayashi, and M. Iwanaga (Tokyo, University, Tokyo, Japan). In: International Symposium on Flow Visualization, Bochum, West Germany, September 9-12, 1980, Preprints of Contributed Papers. Bochum, West Germany, Ruhr-Universität Bochum, 1981, p. 304-308.

The effectiveness of using the oil film method for flow visualization was experimentally tested, with particular regard being given to the limited lines. A test cylinder was coated with light oil or machine oil adulterated with carbon powder and set in a transparent water channel at flows from 10-25 cm/sec. Photographs were taken, and a dye injection technique was used to repeat the same-tests. Two limited lines were observed in the oil flow patterns and in the dye injection, and were found to fluctuate simultaneously. The mean values of the limited lines were also observed to attain a constant value, but only after the passage of a certain period of time. M.S.K.

A82-20813 # **Flow field around an oscillating airfoil.** Y. Oshima (Ochanomizu University, Tokyo, Japan) and A. Natsume (Tokyo, University, Tokyo, Japan). In: International Symposium on Flow Visualization, Bochum, West Germany, September 9-12, 1980, Preprints of Contributed Papers. Bochum, West Germany, Ruhr-Universität Bochum, 1981, p. 315-319. 6 refs.

The wake pattern, the trailing edge flow, and the separated vortex at the leading edge of an oscillating airfoil are discussed, and observed flow patterns are compared with numerical predictions. A NACA 0012 airfoil was affixed to an acrylic plate and heaving and pitching motions were induced. The angle of attack was varied, the half-pitch angle was 10 deg, the oscillation period was 2-5 sec, and the speed of the cart carrying the test object through a tank of water yielded Re between 400-1200. Both the reduced frequency and the reduced heaving amplitude were calculated, and films were taken of each test. The flowfield near the trailing edge was made visible by means of electrolysis and aluminum dust methods. The separation point moved toward the front of the airfoil with increasing angle-of-attack. M.S.K.

N82-16092*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

RESEARCH THROUGH SIMULATION

James L. Copeland, comp. [1982] 30 p refs
(NASA-Facts-125) Avail NTIS HC A03/MF A01 CSCL 14B

The design of the computer operating system at Langley Research Center allows for concurrent support of time-critical simulations and background analytical computing on the same machine. Signal path interconnections between computing hardware and flight simulation hardware is provided to allow up to six simulation programs to be in operation at one time. Capabilities and research applications are discussed for the: (1) differential maneuvering simulator; (2) visual motion simulator; (3) terminal configured vehicle simulator; (4) general aviation aircraft simulator; (5) general purpose fixed based simulator; (6) transport simulator; (7) digital fly by wire simulator; (8) general purpose fighter simulator; and (9) the roll-up cockpit. The visual landing display system and graphics display system are described and their simulator support applications are listed. A.R.H.

N82-16093# Southwest Research Inst., San Antonio, Tex. Mobile Energy Div.

DEVELOPMENT OF THE AUTOMATED AFAPL ENGINE SIMULATOR TEST FOR LUBRICANT EVALUATION Final Technical Report, 1 May 1978 - 1 Jan. 1981

B. B. Baber, M. L. Valtierra, and J. E. Eichelberger Wright-Patterson AFB, Ohio AFWAL May 1981 104 p refs
(Contract F33615-78-C-2012; AF Proj. 3048)
(AD-A106128; SWRI-MED-119; AFWAL-TR-81-2022) Avail: NTIS HC A06/MF A01 CSCL 14/2

A description of an automated gas turbine engine simulator, designated the AFAPL engine simulator, and a discussion of the test results obtained using the simulator are presented. The No. 4-5 bearing compartment areas of a J57 turbine engine are used as the basic hardware for the simulator. The simulator is driven by a variable-speed drive system, through the accessory drive gearbox, providing simulator mainshaft speeds up to 10,000 rpm. Electrical resistance heaters are used to heat the air surrounding the oil-wetted areas within the No. 4-5 bearing compartment areas. The temperatures, pressures, and rpm are automatically controlled at predetermined levels and monitored throughout the 9120-6000 rpm speed cycling sequences and the soakback periods by a Hewlett-Packard mini-computer system, which is also programmed to automatically draw 5-hr interval test-oil samples, control test-oil sump level, provide safety shut-off protection, as well as print out and plot test information generated during each individual test. Simulator results obtained on eight turbine engine lubricants, for which full-scale engine data are available, show a very good correlation of the deposit ratings obtained using the AFAPL engine simulator and the deposit ratings from full-scale engine tests. Author (GRA)

N82-16094# Florida Inst. of Tech., Melbourne. Dept. of Electrical and Computer Engineering.

IMPLEMENTATION OF THE RECOMMENDATIONS MADE ON THE TECHNICAL REPORT TITLED ANALYSIS OF ADVANCED SIMULATOR FOR PILOT TRAINING Final Report

Jonn Hadjilogiou Jun. 1981 111 p
(Grant AF-AFOSR-0120-81; AF Proj. 2313)
(AD-A106779; AFOSR-81-0704TR) Avail: NTIS HC A06/MF A01 CSCL 14/2

This study which was conducted to implement some of the recommendations made on the technical report titled 'Analysis of Advanced Simulator for Pilot Training'. The final report specify guidelines for writing custom micro-programs routine for the 32/75 computer. It includes the hardware feature of the digital system with special emphasis on micro-program control section. The micro-instruction format is analyzed in detail to allow the reader to follow the example of the SEL report reproduced on the Appendices. GRA

N82-16095# Aeronautical Research Labs., Melbourne (Australia).

PROGRAMS FOR THE TRANSONIC WIND TUNNEL DATA PROCESSING INSTALLATION. PART 9: PRESSURE MEASUREMENTS UPDATED

J. B. Willis May 1981 16 p refs
(AD-A106271; ARL/AERO-TM-329) Avail: NTIS HC A02/MF A01 CSCL 09/2

It is now ten years since the original pressure measurement program for the transonic wind tunnel PDP 8/I data processing installation was written. During this period considerable changes have been made, and this memorandum describes the current program. Author (GRA)

N82-16096# Aeronautical Research Labs., Melbourne (Australia).

CURRENT PRESSURE MEASURING SYSTEM IN THE TRANSONIC WIND TUNNEL

J. B. Willis May 1981 16 p ref
(AD-A106272; ARL/AERO-TM-328) Avail: NTIS HC A02/MF A01 CSCL 14/2

A simple system for wind tunnel pressure measurements is described. It is intended for use with Scanivalves, a minicomputer and stagger scans at a preset, variable rate. The scan may be started and stopped under program control, and all Scanivalves are automatically homed at the end of the computer initiated scan. Scanivalve number, port number, and four digits representing the measured pressure are displayed and provided for the minicomputer. Author (GRA)

N82-16097# Aeronautical Research Labs., Melbourne (Australia).

A VERSATILE DATA ACQUISITION SYSTEM FOR A LOW SPEED WIND TUNNEL

W. F. L. Sear, C. W. Sutton, and J. F. Harvey Nov. 1980 54 p
(AD-A106269; ARL/AERO-155; AR-002-248) Copyright. Avail: Issuing Activity CSCL 14/2

A data acquisition system for the Aeronautical Research Laboratories Low Speed Wind Tunnel is described. The system is versatile and simple to operate. Illuminated press button switches connect selected data sources with the addresses automatically generated within the system. Provision also exists for external addressing by a dedicated minicomputer. Author (GRA)

N82-16099# Tactical Air Warfare Center, Eglin AFB, Fla.

QOT AND E OF THE F-16 20MM AMMUNITION LOADING SYSTEM'S ABILITY TO UPLOAD/DOWNLOAD A-7D AIRCRAFT Final Report

27 Oct. 1981 8 p
(AD-A108007) Avail: NTIS HC A02/MF A01 CSCL 19/1

The purpose of this qualification operational test and evaluation (QOT and E) was to evaluate the ability of the F-16 20mm ALS to upload/download A-7D aircraft. Testing included uploading/downloading of 20mm ammunition on A-7D aircraft during normal day-to-day operations and during simulated combat conditions. A portion of the test was conducted with load crews wearing chemical warfare defense ensembles (CWDE). Specific Objectives are: Operational Effectiveness - to assess the capability of the F-16 ALS to upload/download ammunition into/from the A-7D aircraft; to assess the interoperability of the ALS with both the A-7D gun system and the modified replenisher, and to assess the capability of the modified replenisher to replenish the loader. Operational Suitability - Specific suitability objectives were not evaluated during this test. On site observations of some suitability areas (equipment failures, technical data, human factors, and chemical defense) were performed. GRA

N82-16100# Transportation Research Board, Washington, D.C. Commission on Sociotechnical Systems.

AIR SERVICE, AIRPORT ACCESS AND FUTURE TECHNOLOGY

Samuel Ewer Eastman, Frank LaMagna, Edward M. Whitlock, Mark Gorstein, and Richard Tilles 1981 60 p refs
(PB82-105958; TRB/TRR-803; ISBN-0-309-03717-2; ISSN-0361-1981; LC-81-14158) Avail: NTIS HC A04/MF A01; paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, D.C. 20418 CSCL 01B

Contents: (1) economic regulation of air service to small communities: origins of Airline Deregulation Act of 1978; (2) response to terminal access problems at American and United Airlines--John F. Kennedy International Airport; (3) automating the delivery of ground transportation information; (4) airport access--case study of a remote terminal operation; (5) airport geometric compatibility of future aircraft; (6) flight simulators; (7) gravitational-cueing system--an enhancement of aircraft flight simulation; and (8) laser system for visual simulation. GRA

N82-16176*# TRW, Inc., Cleveland, Ohio.

FABRICATION OF BORON/ALUMINUM FAN BLADES FOR SCR ENGINES Final Report, Jun. 1976 - Jun. 1980

G. S. Doble Mar. 1981 49 p refs
(Contract NAS3-20360)

(NASA-CR-165294; ER-7891-F) Avail: NTIS HC A03/MF A01 CSCL 11D

The fabrication of boron/aluminum fan blades for the F-404 Supersonic Cruise Research prototype engine by rapid air bonding of fully dense monotapes is described, and the fan blades evaluated. The F-404 configuration is representative of a low aspect ratio advanced design blade with supersonic capability. Dovetail pull tests of this geometry, which substituted boron/aluminum for titanium, suggested that excessive shear stresses were present in the root. A re-designed blade, incorporating a titanium tang and root, was fabricated by hot isostatic pressing. Blades appeared well bonded but the airfoil contained sizable areas of deformation and identification from the alumina grain used as a pressure transmitting medium. The use of hot isostatic pressing with a formed steel encapsulator should eliminate this problem. J.D.H.

N82-16178*# Boeing Commercial Airplane Co., Seattle, Wash.
ENVIRONMENTAL EXPOSURE EFFECTS ON COMPOSITE MATERIALS FOR COMMERCIAL AIRCRAFT Interim Technical Report, Nov. 1977 - Jul. 1981
Martin N. Gibbins and Daniel J. Hoffman Washington NASA Jan. 1982 129 p refs
(Contract NAS1-15148)
(NASA-CR-3502; D6-51227) Avail: NTIS HC A07/MF A01 CSCL 11D

The effects of environmental exposure on composite materials are studied. The environments considered are representative of those experienced by commercial jet aircraft. Initial results have been compiled for the following material systems: T300/5208, T300/5209 and T300/934. Specimens were exposed on the exterior and interior of Boeing 737 airplanes of three airlines, and to continuous ground level exposure at four locations. In addition specimens were exposed in the laboratory to conditions such as: simulated ground-air-ground, weatherometer, and moisture. Residual strength results are presented for specimens exposed for up to two years at three ground level exposure locations and on airplanes from two airlines. Test results are also given for specimens exposed to the laboratory simulated environments. Test results indicate that short beam shear strength is sensitive to environmental exposure and dependent on the level of absorbed moisture. S.L.

N82-16182*# Rensselaer Polytechnic Inst., Troy, N. Y. School of Engineering.
COMPOSITE STRUCTURAL MATERIALS Semiannual Progress Report, 30 Apr. - 30 Sep. 1981
George S. Ansell, Robert G. Loewy, and Stephen E. Wiberly Dec. 1981 164 p refs Sponsored in part by Air Force
(Grant NGL-33-018-003)
(NASA-CR-165121; SAR-41) Avail: NTIS HC A08/MF A01 CSCL 11D

Physical properties of fiber reinforced composites; structural concepts and analysis; manufacturing; reliability; and life prediction are subjects of research conducted to determine the long term integrity of composite aircraft structures under conditions pertinent to service use. Progress is reported in (1) characterizing homogeneity in composite materials; (2) developing methods for analyzing composite materials; (3) studying fatigue in composite materials; (4) determining the temperature and moisture effects on the mechanical properties of laminates; (5) numerically analyzing moisture effects; (6) numerically analyzing the micromechanics of composite fracture; (7) constructing the 727 elevator attachment rib; (8) developing the L-1011 engine drag strut (CAPCOMP 2 program); (9) analyzing mechanical joints in composites; (10) developing computer software; and (11) processing science and technology, with emphasis on the sailplane project. A.R.H.

N82-16385# Dynamic Science, Phoenix, Ariz.
ADVANCED RECORDER DESIGN AND DEVELOPMENT Final Report, Jun. 1977 - Feb. 1981
Carroll D. Thatcher Feb. 1981 192 p refs
(Contract DOT-HS-7-01640)
(PB81-244105; DOT-HS-805914) Avail: NTIS HC A09/MF A01 CSCL 13L

A prototype crash recorder measuring and storing time histories of vehicle lateral and longitudinal accelerations, during a collision was designed, fabricated, and subjected to environmental tests. The recorder features low cost accelerometers, signal conditioning circuitry, A/D converter, microprocessor and digital storage. Accelerometer outputs are continuously sampled and stored in digital memory. The microprocessor monitors Delta V and compares it to a selectable criterion. When Delta V exceeds the criterion recent acceleration time histories are permanently stored in memory. The stored signals include acceleration data prior to and subsequent to the crash event. Methods of implementing the recorder including discussion of distribution in vehicle fleets, data retrieval, including hardware and software, and data processing software are provided. DOE

N82-16665*# MCS, Inc., Boulder, Colo.
NUMERICAL AND FLIGHT SIMULATOR TEST OF THE FLIGHT DETERIORATION CONCEPT Interim Report
John McCarthy and Vern Norviel Washington NASA Jan. 1982 37 p refs
(Contract NAS8-33458)
(NASA-CR-3500; M-370) Avail: NTIS HC A03/MF A01 CSCL 04B

Manned flight simulator response to theoretical wind shear profiles was studied in an effort to calibrate fixed-stick and pilot-in-the-loop numerical models of jet transport aircraft on approach to landing. Results of the study indicate that both fixed-stick and pilot-in-the-loop models overpredict the deleterious effects of aircraft approaches when compared to pilot performance in the manned simulator. Although the pilot-in-the-loop model does a better job than does the fixed-stick model, the study suggests that the pilot-in-the-loop model is suitable for use in meteorological predictions of adverse low-level wind shear along approach and departure courses to identify situations in which pilots may find difficulty. The model should not be used to predict the success or failure of a specific aircraft. It is suggested that the pilot model be used as part of a ground-based Doppler radar low-level wind shear detection and warning system. T.M.

N82-16759# Radio Technical Commission for Aeronautics, Washington, D. C.
SOFTWARE CONSIDERATIONS IN AIRBORNE SYSTEMS AND EQUIPMENT CERTIFICATION
18 Nov. 1981 67 p refs
(RTCA/DO-178) Avail: NTIS HC A04/MF A01 CSCL 09B

A disciplined approach to avionics software design, development, testing, configuration management, and documentation is presented. Guidance is provided for different levels of criticality of the functions for which the software is designed. The need for software modification by manufacturers and users is considered, together with its impact on pre- and post-certification configuration management and documents. Methods alternative to the techniques recommended here may be used if equivalence is shown. A glossary of terms is provided. J.D.H.

N82-16800* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
MULTIPLE PURE TONE ELIMINATION STRUT ASSEMBLY Patent
Frank W. Burcham, inventor (to NASA) Issued 17 Nov. 1981 4 p Filed 11 Sep. 1980 Supersedes N80-32393 (18 - 23, p 3094)
(NASA-Case-FRC-11062-1; US-Patent-4,300,656; US-Patent-Appl-SN-185869; US-Patent-Class-181-214) Avail: US Patent and Trademark Office CSCL 20A

An acoustic noise elimination assembly is disclosed which has a capability for disrupting the continuity of fields of sound pressures forwardly projected from fans or rotors of a type commonly found in the fan or compressor first stage for air-breathing engines, when operating at tip speeds in the supersonic range. The assembly includes a tubular cowl defining a duct for delivering an air stream axially into the intake for a jet engine. A sound barrier, defined by a number of intersecting flat plates or struts has a line of intersection coincident with a longitudinal axis of the tubular cowl, which serves to disrupt the continuity of rotating fields of multiple pure tonal components of noise.

Official Gazette of the U.S. Patent and Trademark Office

N82-16801*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING Annual Progress Report
Carl H. Gerhold Jan. 1982 39 p refs
(Grant NAG1-11)
(NASA-CR-165102; APR-2) Avail: NTIS HC A03/MF A01 CSCL 20A

Progress in the refinement and evaluation of an analytical jet shielding model are summarized. The model consists of a

N82-17196# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
SINGLE STAGE TRANSONIC COMPRESSOR AND EQUIVALENT PLANE CASCADE
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 221-228 refs

Avail: NTIS HC A15/MF A01

The working group 12 activities cover primarily turbomachinery off design performance prediction, however include also blade to blade calculation on relevant test cases to get more information on those basic flow phenomena that affect flow losses and turning in blade rows. One of the test cases selected is the DFVLR single stage transonic compressor that was tested in great detail with the results well documented, particularly intrablade velocity data of the rotor are available from extensive flow studies with laser velocimetry. The data allow to compare blade to blade calculations to actual transonic compressor flow. Additionally to the rotor tests the rotor blade section at 45% span was investigated in the DFVLR transonic cascade windtunnel. L.F.

N82-17197# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
BBC/SULZER. 4 STAGE TRANSONIC COMPRESSOR
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 229-244
Avail: NTIS HC A15/MF A01

Tests were performed on the BBC/SULZER 4 stage Transonic Compressor. The overall performance map and some traverse of stagnation pressure and temperature at compressor outlet are presented. L.F.M.

N82-17198# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
RESULTS OF CALCULATIONS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 245-246 ref

Avail: NTIS HC A15/MF A01

The types of calculations were performed by various participants, each using his own method for through flow calculations and blade to blade calculations. The Working Group's task was to demonstrate that the use of systematic blade to blade calculations could provide a support for the confirmation of an existing correlation or the development of a new one. It is believed that the present development and state of the numerical tools available in order to compute complex flow structures, should be used more and more extensively in order to develop a deeper understanding of the flow mechanism of loss production and of turning. L.F.M.

N82-17199# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE THROUGH FLOW CALCULATIONS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 247-268 refs

Avail: NTIS HC A15/MF A01

Through flow calculations of three test cases were performed by various authors belonging to industrial or research organizations. The four-stage transonic compressor, the two-stage compressor, and the single stage compressor are discussed. L.F.M.

N82-17200# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
EVALUATION OF PROFILE LOSS PREDICTIONS BASED ON DIFFUSION FACTORS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 269-280 refs

Avail: NTIS HC A15/MF A01

A comparison between theoretically predicted and measured profile losses was made, in order to evaluate the precision of the different prediction methods. These prediction methods are based on the relation between suction side diffusion and profile losses. The evaluation concerns as well the prediction of diffusion factor as predicted values of profile losses. It is further shown that these correlations are not universally valid for all blade shapes and that some correlations perform as well at design as at off design if the suction side diffusion is correctly predicted. Author

N82-17201# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
AXIAL-FLOW TURBOMACHINE THROUGH FLOW CALCULATION METHODS
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 285-306 refs

Avail: NTIS HC A15/MF A01

Through flow calculation methods are considered to be computational techniques for prediction of fluid velocities and thermodynamic properties at designated locations in the internal flow path of a turbomachine. The objectives are to trace the development of several classes of through flow calculation, to suggest the importance of understanding the assumptions underlying representative examples of each class, and to outline the principal problems in application of through flow methods to current axial-flow compressors and turbines. L.F.M.

N82-17202# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
BLADE-TO-BLADE COMPUTATIONS AND BOUNDARY LAYER CORRECTIONS IN AXIAL COMPRESSORS AND TURBINES
In its Through Flow Calculations in Axial Turbomachines Oct. 1981 p 307-326 refs

Avail: NTIS HC A15/MF A01

The number of inviscid calculation methods available today is quite impressive, and they allow an accurate prediction of inviscid incompressible, subsonic compressible and transonic flow. Recent progress has also resulted in a remarkable decrease of required computational effort, which makes them even more attractive to industrial applications. However, as these methods do not account for viscosity, the field of application is quite restricted, and good predictions can be obtained only for flow configurations where viscous effects can be neglected (e.g., turbines and low loaded compressor cascades). A similar conclusion can be drawn about boundary layer methods, with a limitation on shock boundary layer interaction, where complete solutions still require a large amount of computational effort. The combination of these two types of calculations started quite recently, and a lot of progress can be expected in the near future. Improvements which can be expected from a better combination of these two types of calculations will be more important than an improvement in the inviscid calculations. Based on the present state of the art concerning shock boundary layer interaction calculations, it appears that integral or inverse methods are the best suited to industrial calculations. However, in view of the considerable efforts currently made towards the development of the Navier-Stokes equation solution, it is more likely that, in the near future, this method will lead to more reasonable computation times and permit practical applications. L.F.M.

N82-17203# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HELICOPTER PROPULSION SYSTEMS
Sep. 1981 277 p refs Partly in ENGLISH, partly in FRENCH
Meeting held in Toulouse, 11-14 May 1981
(AGARD-CP-302; ISBN-92-835-0299-X) Avail: NTIS HC A13/MF A01

Component technology for turboshaft engines and transmissions, inlet protection systems, engine-airframe dynamic compatibility, and future requirements are described.

N82-17204# Textron Bell Helicopter, Fort Worth, Tex.
HELICOPTER PROPULSION SYSTEMS: PAST, PRESENT AND FUTURE
Robert R. Lynn and Gordon E. Holbrook *In* AGARD Helicopter Propulsion Systems Sep. 1981 12 p refs

Avail: NTIS HC A13/MF A01

Helicopter propulsion systems are reviewed, and it is noted that helicopter development is paced to a major extent by the power plant. Power available, reliability, fuel consumption, power-to-weight ratio, and life cycle costs are key parameters. The application of emerging technologies such as microelectronics, ceramics and other new materials and approaches, and the continuing refinement of the aerodynamics and dynamics of gas turbine power plants are discussed and noted to result in a significant benefit to the helicopter and its operator. Important airframe-propulsion system interface requirements are given, and the need is discussed for new innovative certification procedures that provide for emergency operation with acceptable economics. Finally, future propulsion system capabilities are projected and their dramatic benefit for the helicopter noted. Author

N82-17205# Societe Turbomeca, Bordes (France).
DEVELOPMENT TEST PROGRAMS ADAPTED TO HELICOPTER ENGINES [PROGRAMMES D'ESSAIS DE DEVELOPMENT ADAPTES AUX MOTEURS D'HELICOPTERES]
J. Fresco *In* AGARD Helicopter Propulsion Systems Sep. 1981 9 p In FRENCH

Avail: NTIS HC A13/MF A01

The path to follow in a general program of engine development is shown with constraints of various kinds. There are regulatory requirements established by laws of navigability for civil aviation engines, and particular technical specifications for military aviation engines. Requirements of an operational order happen to be juxtaposed to precedents which are set by the different types of usages envisioned: flight profiles of various missions, and the environmental conditions likely to be encountered. This second factor is particularly important for a helicopter turbine because of the different utilizations and environmental conditions compared to a jet or turboprop engine. To address all these requirements, a test program must be built which, among others, takes into consideration this group of sometimes contradictory constraints in order to obtain certification and as well as to bring about development and operation without major risk. Specific tests for a helicopter turbine are examined with emphasis on the MAKILA program turbine which is on the AS-332 super PUMA. Transl. by A.R.H.

N82-17206# Army Aviation Research and Development Command, St. Louis, Mo.
AIRCRAFT TURBINE ENGINE DEVELOPMENT: CURRENT PRACTICES AND NEW PRIORITIES
Charles C. Crawford, Jr. and William J. Crawford, III (GE, Lynn, Mass.) *In* AGARD Helicopter Propulsion Systems Sep. 1981 8 p
Avail: NTIS HC A13/MF A01

The T700 engine program was conducted during the 1970's and is representative of recent practices employed in the development of turboshaft engines for U.S. military application. The engine, which is in the 1,600 horsepower class, recently entered service in the twin engine U.S. Army UH-60A Black Hawk helicopter. The T700's field introduction follows an extensive program of technology demonstration, development, qualification and maturity. Requirements applied in the T700 program and associated benefits, challenges and penalties are surveyed. Suggested improvements for future programs are offered, and technology needs revealed during T700 development are identified. Post-qualification maturity testing, which was conducted to provide early exposure of high time failure modes, is described. Program features which are important for development costs payback are summarized. J.D.H.

N82-17207# Ministry of Defence, London (England). Directorate of Engine Technology.
FUTURE TECHNOLOGY AND REQUIREMENTS FOR HELICOPTER ENGINES
M. D. Paramour and M. J. Sapsard *In* AGARD Helicopter Propulsion Systems Sep. 1981 12 p refs

Avail: NTIS HC A13/MF A01

The design considerations and technology needed to meet possible future operational requirements are discussed and the relevent technological work being carried out or supported by the UK Ministry of Defence (Procurement Executive) is described. Also considered are the tradeoffs which become necessary in seeking a suitable solution to conflicting needs. Finally the sizes of engines required to meet likely aircraft applications are examined. J.D.H.

N82-17208# Rolls-Royce Ltd., Leavesden (England).
MECHANICAL ADVANCES IN THE DESIGN OF SMALL TURBOSHAFT ENGINES
J. Dominy and K. J. Hart *In* AGARD Helicopter Propulsion Systems Sep. 1981 12 p

Avail: NTIS HC A13/MF A01

Mechanical components have a significant influence on the efficiency of a small gas turbine engine. Some of the performance losses associated with the design of the power transmission and internal air system are defined and discussed. Improvements in engine efficiency must be considered in conjunction with cost, reliability and size or weight. Many of the problems considered are applicable to gas turbines in general but become acute in small engines due to the adverse effects of scale on many components design parameters. To meet the increasing demand for more efficient powerplants the mechanical research engineer must improve the analysis of mechanical component behavior to produce optimized engine designs. Author

N82-17209# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
ADVANCED COMPONENT DEVELOPMENT DESIGN BASIS FOR NEXT GENERATION MEDIUM POWER HELICOPTER ENGINES
Jean Hourouziadis and Horst B. Kreiner *In* AGARD Helicopter Propulsion Systems Sep. 1981 13 p refs

Avail: NTIS HC A13/MF A01

Assuming an optimized thermodynamic cycle, engine components requiring intensive research and development efforts to produce a mature and reliable production engine are identified. Aerodynamic and structural data from rig and demonstrator test programs are presented. J.D.H.

N82-17210# Societe Turbomeca, Bordes (France).
THE INFLUENCE OF NEW TURBINE TECHNOLOGIES ON THEIR COMPONENTS [INFLUENCE DES NOUVELLES TECHNOLOGIES DES TURBINES SUR LEURS COMPOSANTS]
M. Giraud and H. Loustalet *In* AGARD Helicopter Propulsion Systems Sep. 1981 11 p In FRENCH

Avail: NTIS HC A13/MF A01

The interdependence of the turbine engine with that of its components is considered as well as the objectives for developing future helicopter engines with average power. The classic design of an engine is used to show that a new architecture is required in order to reduce costs and increase reliability. The engine architecture has a strong impact on the technology and performance of its components and this places imposes on the designer new technologies for construction. High pressure turbines, reverse flow combustion chambers, and axial and centrifugal compressors are discussed. Transl. by A.R.H.

N82-17211# Avco Lycoming Div., Stratford, Conn. Preliminary Design and Advanced Programs.
AERODYNAMIC COMPONENTS FOR SMALL TURBOSHAFT ENGINES
J. W. Schrader and W. F. Schneider *In* AGARD Helicopter Propulsion Systems Sep. 1981 15 p

Avail: NTIS HC A13/MF A01

Future developments of advanced helicopter engines are projected from an aerothermodynamic viewpoint. Cycles for engines aiming at lower specific fuel consumption, improved power lapse rates, and implementation of contingency ratings are discussed. These cycles include nonregenerative and regenerative cycles. Design trends are presented for the major engine aerodynamic components. Author

N82-17212# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
REGENERATIVE HELICOPTER ENGINES: ADVANCES IN PERFORMANCE AND EXPECTED DEVELOPMENT PROBLEMS
H. Grieb and W. Kluesmann *In* AGARD Helicopter Propulsion Systems Sep. 1981 12 p ref Sponsored by Ministry of Defence of the Federal Republic of Germany

Avail: NTIS HC A13/MF A01

On the basis of modern engine component technology, including and emphasizing recent progress in high temperature heat exchanger technology, a conventional and a regenerative helicopter engine in the 900 kW power class are compared in design, performance and life cycle costs. The comparison shows that the installation properties of the two engines are roughly the same. The variable power turbine, being an indispensable part of a regenerative engine, leads to an extremely favorable transient behaviour with a moderate influence of severe cyclic loading on hot-part lifetime. No significant difference exists in

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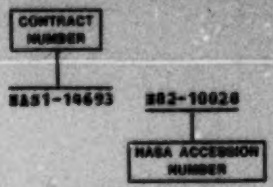

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small general aviation aircraft, chartered jets, or scheduled air services. M.S.K.

A82-19003 **Survey of aeromedical evacuation in Italy.** C. Manni (Roma, Università Cattolica, Rome, Italy) and G. Ruggieri. In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 73-75. 6 refs.

Aeromedical rescue efforts in Italy, primarily performed by the Italian Air Force, are outlined. Air rescue is mainly confined to remote locations or small islands, and follows the identification by county authorities of the level of the request, the availability of beds in the nearest hospital, and the ensurance of ground transport from the nearest airfield. The Air Force is responsible for providing personnel and machines, including fixed wing aircraft or helicopters, and readiness requirements are detailed. It is noted that the overlapping of various jurisdictional regions by armed forces, state corps, and governing bodies sometimes results in a redundancy of services arriving for the same rescue mission. The training of Air Force aeromedical personnel for first aid and resuscitation tasks is discussed, and can comprise basic medical actions which justify the cost of airborne rescue. M.S.K.

A82-19004 **The network of civilian air rescue in Germany (Das Netz der zivilen Luftrettung in Deutschland).** G. Kugler (Allgemeiner Deutscher Automobil-Club, Munich, West Germany). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 76-79. In German.

For the last 10 years a network of 26 helicopter air rescue stations have been in operation in West Germany, which can reach 80% of the population within 15 minutes. This civilian air rescue system is used to transport physicians to the scene of an accident, transport patients to hospitals or specialized clinics, transport organs, medical equipment or blood, and act as a search vehicle over mountainous land. Since the beginning of the program, 88,000 rescue flights have been completed, with a maximum daily frequency of 15 flights. In addition to the helicopter rescue program, West Germany has an ambulance aircraft service that specializes in flying patients from outlying areas to suitable clinics in the interior of the country for treatment. D.L.G.

A82-19005 **Ambulance helicopter in the Stockholm archipelago.** B. Brismar (Huddinge University Hospital, Huddinge, Sweden) and A. Alveryd. In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 85-87.

The results of a summer trial program for aeromedical relief of persons in the Swedish archipelago are reported. A Bell 206 helicopter provided room for a pilot, a prone passenger, and a seated passenger. Noting that in no instance was more than one patient transported at a time, the response time from call receipt to chopper arrival was an average of 25 min, and was extended only when the helicopter was otherwise occupied with another call or during night and bad weather conditions. The lack of an on-site, suitable helicopter landing pad at some hospitals forced a transfer of 85% of the patients by surface ambulance to a hospital in other locations. The cost of the helicopter service was about four times the cost of calling an ambulance in Stockholm, and it was found that in only 16% of the calls was a trained physician necessary, with most cases amenable to treatment by a nurse or other paramedic. M.S.K.

A82-19006 **Military assistance to safety and traffic /MAST/.** W. R. Gemma (U.S. Department of Health and Human Services, Office of International Health Affairs, Rockville, MD). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 90-94.

The lessons learned and the organizational scheme for the U.S. Military Assistance to Safety and Traffic (MAST) Program are examined. A six-month evaluation of five demonstration sites showed that the use of military personnel and equipment, including helicopters, for emergency medical services is feasible, the military provides round-the-clock readiness, while communities must actively seek to utilize the sources available, and some resistance to MAST use was encountered with local law enforcement agencies. The performance of MAST missions was found to serve as training and mandatory flight time for military personnel, and was employed by civilians only when the available civilian aeromedical services were considered inadequate. Problems of communications involved providing civilian coordinating teams with units compatible with military communications. M.S.K.

A82-19007 **Aerial ambulance service in Australia.** S. Rowley (Sydney Helicopter Rescue Service, Sydney, Australia). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 94-99.

The operations of the Royal Doctor Flying Service of Australia, which provides medical services for persons living in the remote regions of the Outback, are described. All the doctors are pilots, and also run daily two-way radio clinics, fly rounds for immunization programs, and accompany emergency aeromedical evacuation teams to transfer seriously ill or injured persons to medical facilities. Surf rescue and other coastal aeromedical functions are enacted by helicopter services, which feature a crew comprising a pilot, a rescue crewman, and a doctor. The services are available to everyone, and no charge is levied on anyone or any community for the services rendered. M.S.K.

A82-19008 **Flying doctor service in East Africa.** A. M. Wood (Flying Doctor Service of Africa, Nairobi, Kenya). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 100-103.

The various features of the East Africe Flying Doctor Service are outlined. The service comprises eight aircraft and a radio network of 100 stations, with calls averaging 2200/mo. Over 100 airstrips are provided near medical facilities, and the flying doctor performs a routine six-month circuit, with the emergency calls occurring at any time. Treatment is confined to dealing with the patient on-site wherever possible, due to overcrowded hospitals, the patient's familiarity and tasks at home, and the opportunity to treat other persons while on the visit. A complete operating team travels on each trip, and also a pilot who is frequently from the region and has a commercial pilots' rating. It is noted that the aircraft method provides a service where otherwise there would be none at all. M.S.K.

A82-19009 **Air ambulance systems in the Republic of South Africa.** G. O. F. Lippert. In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 104-107.

The operations of the three air ambulance systems in South Africa are discussed. The Johannesburg district has the only helicopter ambulance service, and services an area 500 km in radius. A three minute interval exists between call arrival and dispatch with a full medical team on board. The commercial helicopter firms in Cape Town also offer a 300 km radius air ambulance service, while other population centers have fixed-wing services with either voluntary or Red Cross personnel as the medical teams. Military air ambulances are reserved for particular rescue missions, and it is noted that emergency notification is usually accomplished by telephone. M.S.K.

A82-19010 **The situation of air rescue in Argentina (Die Situation der Luftrettung in Argentinien).** K. Liebig (Rappard y Cia, S.A., Buenos Aires, Argentina). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 108-110. In German.

Due to the geography of Argentina, air rescue is often the only possible mode of rescue. In case of land catastrophes such as earthquakes, the army will be used to evacuate the elderly, the children and the injured from the area, and fly in medical aid and foodstuffs. Helicopters are often used by the police to rescue people from tall buildings, and water emergencies are taken care of by a special branch of the police who are in charge of the rivers and coasts in the region. Their duties include rescue operations in case of flooding, usually using helicopters. In 1979, the four helicopters in the program flew 320 hours and aided 355 people. D.L.G.

A82-19011 **Aeromedical evacuation in New Zealand.** R. J. Worth. In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 120-122.

The operations and integration of military, government, and private air ambulance services in New Zealand are explored. Only one commercial air ambulance helicopter service exists, which logged 40 missions in its first year of operations carrying premature babies, pregnant mothers, burns victims, trauma victims, and patients with head injuries. The helicopter is used for commercial purposes until called on to make a medical emergency call, when a medical supplies unit can be mounted on-board in four minutes. The role of the U.S. Air Force in carrying out rescue missions in Antarctica from the base at Christchurch is reviewed, and a recommendation is made for a central command to coordinate the activities of the U.S. Air Force, the New Zealand Air Force, and the private aeromedical services. M.S.K.

A82-19013 **A comparative study on mechanical vibration and noise during patient transportation.** S. Rowley (Sydney Helicopter Rescue Service, Sydney, Australia). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 175-177. 5 refs.

The magnitude of mechanical vibration and noise has been investigated for three different forms of patient transportation: helicopters, fixed-wing aircraft, and road vehicles. The figures obtained for all forms of patient transportation studied are below the level set by international standards, but no conclusive evidence of adverse effects on injured tissue is yet available. It is noted that in the case of the helicopter, where the vibration frequencies (6.5, 13, and 19 Hz) are constant during the entire flight, some components are located in the resonance frequency spectrum of some body organs. It is, however, possible to reduce the magnitude of these critical frequencies more readily than to suppress not only the very low frequencies, but also the displacement of the body occurring both in the fixed-wing aircraft and in the road vehicle. V.L.

A82-19015 **Helicopter secondary applications for neurotraumatic emergencies (Helikopter-Sekundäreinsätze für neurotraumatologische Notfälle).** L. M. Auer (Universitätsklinik für Neurochirurgie, Graz, Austria). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 184-186. In German.

Since the life of patients can depend on minutes in neurological cases, the fastest possible transportation of trained neurological surgeons is very important. Since many mountainous regions in Austria are hours away by car from clinics where patients can receive proper neurological care, a program was developed whereby helicopters can transport neurosurgeons to the patients often within minutes. The system allows the patient to be operated on immediately without being moved, and afterwards the patient can either be flown to a neurological clinic or remain in the original hospital for post-operative care. Results of the program have been good; in 1973-1974 before the program, only 25% of neurotraumatic patients survived, while in 1977-1979 after the application of the program, 58% of the patients survived. D.L.G.

A82-19017 **Helicopters - Night operations (Hubschrauber - Einsätze bei Nacht).** C. Bühler (Schweizerische Rettungsflugwacht, Zurich, Switzerland). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 214-216. In German.

In Switzerland the helicopter is often used to transport accident patients from the south to the university clinics in the north. Pilots are required to make three types of flights: return flights to the homebase, flights to familiar destinations such as hospitals, and flights to unfamiliar destinations such as where first aid is administered. Weather is critical, and bad weather can create delays and additional risk. Accessories are used to improve flying, including obstacle maps, altimeters, night viewing goggles, and projector lamps, and electronic equipment may be used in the future to improve vision. D.L.G.

A82-19018 **Problems pertaining to aeronautical technology in the case of rescue operations with helicopters in mountainous areas (Flugtechnische Probleme beim Bergrettungseinsatz mit Hubschraubern).** B. Klingner (Bundeswehr, Penzing über Landsberg, West Germany). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 219-222. In German.

The use of helicopters for rescue operations in mountainous areas can provide sometimes very great advantages compared to an employment of more conventional means. However, the conditions might be such that a use of helicopters, although urgently needed, is not possible in connection with technological and environmental factors. An investigation is conducted regarding the criteria which have to be taken into account in an evaluation concerning the feasibility of an employment of a helicopter in a specific situation, giving attention to limitations with respect to machines and pilots. Aspects of engine performance are considered along with the helicopter payload, the weather, and a special training of helicopter pilots for flight operations in mountainous areas. G.R.

A82-19019 **The helicopter in rescue operations in high-mountain areas (Der Hubschrauber beim Rettungsdienst im Hochgebirge).** W. Phleps and G. Flora (Innsbruck, Chirurgische Universitätsklinik, Innsbruck, Austria). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobil-Club, 1981, p. 222-229. In German.

The use of helicopters for rescue operations in high-mountain areas is briefly reviewed. It is pointed out that in a number of cases the employment of a helicopter represents the only possibility to effect a rescue. It is estimated that, taking into account only the Alps, considerably more than 100 persons owe their rescue from certain death each year exclusively to the availability of a helicopter. The decision regarding an employment of a helicopter in an area of high mountains is based on three criteria, which are related to the medical aspects involved, considerations regarding the general feasibility of rescue operations, and economic factors. Differences regarding the characteristics of helicopter operations in mountainous areas and in flat country are discussed, and a description is provided of the advantages and drawbacks of the five helicopter types which are most frequently employed in the Alps. G.R.

A82-19020 **Design requirements for modern rescue helicopters (Konstruktive Anforderungen an moderne Rettungshubschrauber /RTH/).** E. Weiland (Messerschmitt-Bölkow-Blohm GmbH, Unternehmensbereich Drehflüger und Verkehr, Munich, West Germany). In: Aeromedical evacuation: Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports.
Munich, Allgemeiner Deutscher Automobile-Club, 1981, p. 418-436. In German.

The architecture and size of a rescue helicopter is determined by its function as well as the time and space required to successfully complete its mission. A matrix is presented which outlines the various technical requirements of a rescue helicopter and the corresponding design solutions. The resulting architecture includes a helicopter airframe with a large interior cabin for transporting and caring for the sick or injured; a wide door to facilitate loading; a main rotor with at least three blades; a rotor arrangement that vol. 19, Jan.-Feb. 1982, p. 86, 87. 7 refs. Research sponsored by the Indian Space Research Organization.

Wind tunnel roll damping data on the Basic Finner are presented for subsonic speeds up to Mach 3. Rolling moment coefficients were obtained with a 5% accuracy in the transonic regime and to within 3% at supersonic speeds. A drop in roll damping in the transonic region is attributed to the occurrence of a shock wave on the fin causing a drop in fin lift. The measured roll rate coefficient was found to be invariant with the roll rate at all Mach speeds at zero angle of incidence, in contrast to previous tests in which the roll rate constant remained invariant with the rate only in supersonic regimes. M.S.K.

A82-19966 # **Fuel property effects on radiation intensities in a gas turbine combustor.** J. A. Clark (Ohio State University, Columbus, OH). *AIAA Journal*, vol. 20, Feb. 1982, p. 274-281. 20 refs.

The effect of fuel properties on primary zone radiation intensities in gas turbine combustors is examined. This study concludes that there is a strong empirical relationship between the primary zone radiation intensity and two fuel properties - percent hydrogen and percent polycyclic aromaticity. These two properties are combined in a single parameter called 'effective hydrogen content,' which is then used to correlate radiation intensities from seven different fuels burning under a variety of operating conditions. The explanation for the empirical relationship is that effective hydrogen content is a measure of the soot-forming tendency of a fuel. (Author)

A82-19970 **Ground reflection effects in aircraft noise measurements (Bodenreflexionseffekte bei Fluglärmessungen).** W. M. Dobrzynski (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Abteilung Technische Akustik, Braunschweig, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung*, vol. 5, Nov.-Dec. 1981, p. 367-374. 6 refs. In German.

Aircraft noise measurements were carried out for the certification of propeller aircraft (weighing no more than 5.7 tons), and the maximum A-weighted flyover noise level was determined as a coefficient of measure. Since the flyover signal is known to be affected by ground reflection interference experimental and theoretical methods were used to determine the extent to which these effects can also change the maximum A-weighted flyover noise level. Measurements were made by microphones on several aircraft at 1.2 m in altitude; a second microphone was placed on the ground as a reference. Calculations and measurement results show that, depending on the propeller rotational speed and blade number, level differences of up to 3 dB(A) can be obtained between unaffected signals plus signals affected by reflection interference. J.F.

A82-20054 **Ultrasonic method for flow field measurement in wind tunnel tests.** R. H. Engler, D. W. Schmidt, W. J. Wagner, and B. Weitemeier (Max-Planck-Institut für Strömungsforschung; Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Göttingen, West Germany). *Acoustical Society of America, Journal*, vol. 71, Jan. 1982, p. 42-50. 14 refs.

An ultrasonic measuring system suitable for rapid and nondisturbing measurements of the flowfield around models in wind tunnels is presented. The shift in two sound beams propagating parallel to one another when crossing a vortex is modeled, and the velocity field traversed is defined. The running times of the sound beams are used to determine the circulation of the vortex under test directly from a derived curve. Condensor microphones emit the sound pulses, which are received by similar apparatus for processing by computer. Examples are provided for a single vortex, for the influence of a spoiler, and for tip vortices behind an oscillating blade. Future developments in the system which include using an array of up to 18 ultrasonic microphones to eliminate mechanical shifting of the model are indicated. M.S.K.

A82-20058 **Comparison of aircraft and ground vehicle noise levels in front and backyards of residences.** J. C. Ortega (Paul S. Veneklasen and Associates, Santa Monica, CA) and K. D. Kryter (SRI International, Menlo Park, CA). *Acoustical Society of America, Journal*, vol. 71, Jan. 1982, p. 216, 217.

Measurements and measurement techniques for comparing front and backyard noise levels for aircraft and surface vehicle noises are presented. Microphones in the front and back of a house were used to gather sounds from aircraft taking off, a manual shift small vehicle pulling in and out of the driveway, and a garbage collection truck making its rounds past the front of the house. Two residences were monitored, and the tapes were analyzed for maximum A-weighted noise levels. The reduction for surface vehicle noise traveling from front-to-back of the house ranged from 17-21 dBA, while no significant difference was found for the aircraft noise. M.S.K.

A82-20128 **Design of the composite spar-wingskin joint.** R. D. Cope and R. B. Pipes (Delaware, University, Newark, DE). *Composites*, vol. 13, Jan. 1982, p. 47-53. Contract No. F33615-77-C-3132.

A variety of composite spar-wingskin joint concepts have been investigated to optimize out-of-plane strength while still providing low weight and ease of fabrication. The spar-wingskin configuration consists of a thin spar which overlaps and is co-cured perpendicular to a thick wingskin. Investigation parameters were the joint geometry in the immediate vicinity of the base of the spar, and the spar-to-spar spacing. It was found that by varying the overlap geometry and decreasing the interspar spacing a significant increase in out-of-plane strength could be realized. A theoretical analysis was made by the extended use of the finite element technique. Joint strength was predicted through the application of Tsai-Wu, maximum stress and maximum shear failure criteria. These results were verified by comparison to experimental results in which all significant concepts were fabricated and tested. (Author)

A82-20137 **The prospects for liquid hydrogen fueled aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, CA). *International Journal of Hydrogen Energy*, vol. 7, no. 1, 1982, p. 21-41. 12 refs.

It is pointed out that an alternative fuel for transport aircraft must be either producible or available anywhere in the world. It is contended that this requirement can be met by liquid hydrogen because it can be produced from water using any locally available energy source. It is not dependent on the availability of fossil resources. With conventional production technologies, LH2 may cost more per unit energy than hydrocarbon alternatives. Because of the weight advantage, however, aircraft using LH2 will be more efficient and their direct operating costs will be competitive. It is shown that, with advanced technologies, LH2 can provide cost and energy advantages. A plan to develop LH2 technology on an international basis is proposed. C.R.

A82-20172 **New life for an 'old' body - Vienna's master plan for revitalization.** R. Schano. *Airport Forum*, vol. 11, June 1981, p. 27, 28, 30, 32.

Details of a new master plan for the Vienna airport are presented, noting the departure from a piece-by-piece add-on system to meet new demands. The plan was developed to anticipate the needs and services for an increase of one million passengers/yr every five years until the year 2000. A decision was reached to expand the existing terminal, making more efficient use of available space. The two legs of the V-shaped runways will be extended and equipped for Cat 3, all-weather conditions, sufficient for the 230,000 projected aircraft movements which prodded the expansion. The phased improvements will be undertaken while the airport continues normal operations, and will at some point involve ferrying passengers to parked aircraft by wide-bodied buses. A doubling of the ramp area is also planned. M.S.K.

A82-20221 **Movement in Category III conditions.** P. J. Hunt (British Airways, Hounslow, Middx., England). *Aircraft Engineering*, vol. 53, Dec. 1981, p. 14-17.

All-weather operations are defined and discussed for the London Heathrow Airport. The decision height and the runway visual range are the critical parameters for choosing the operational conditions and the category. To make a landing with 100 m visibility and a decision height of 10-20 ft, a fully automatic landing system is required and must operate fully linked with an ILS localizer on the ground. Traffic is cleared of the sensitive landing corridor to maintain clean signals to the incoming craft just before touchdown.

The distance at Heathrow is set at 135 m, and it is noted that the procedures reduce the rate of arrivals by only one/hour. A surface radar is employed to maintain surveillance over ground traffic and control the patterns, mainly through a controllable taxiway centerline, stop-bar lights, and a flashing red Category 2/3 holding point marker. M.S.K.

A82-20222 **Ground movement control and guidance - Cat. 3 operations experience in Air Inter.** Mr. Roland-Billecart (Air Inter, Paray-Vieille-Poste, Essonne, France). *Aircraft Engineering*, vol. 53, Dec. 1981, p. 17-19.

A82-20266 **Pressure dependence of jet noise and silencing of blow-offs.** D.-Y. Maa and P.-Z. Li (Chinese Academy of Sciences, Acoustics Institute, Beijing, People's Republic of China). *Noise Control Engineering*, vol. 17, Nov.-Dec. 1981, p. 104-112. 13 refs.

Improvements in methods of jet noise prediction and reduction are discussed. Measurements were performed on a cold-air jet exiting through convergent nozzles of varying diameters, and on superheated jet streams at an oil refinery. A critical value was determined for the stagnation pressure, beyond which the jet becomes choked and shock-cell noise occurs along with turbulent noise. The turbulent noise was isolated by making the lip of the jet irregular, then measuring the A-weighted sound level. Blow-down studies were also made of the shock-cell noise, which was found to happen above the frequency peak of the turbulent noise. The interaction of microjets grouped together is considered, noting that a form of the Coanda effect causes the formation of a single jet. A micropore muffler is presented, which consists of a pipe drilled with many holes, and a diffuse-muffler is mentioned, which contains randomly distributed holes internally to dampen the noise emission. M.S.K.

A82-20276 **Computer graphics for quality assurance.** V. W. Gott (Northrop Corp., Aircraft Div., Hawthorne, CA). *IEEE Computer Graphics and Applications*, vol. 2, Jan. 1982, p. 39-41, 43, 44.

The use of CAD/CAM for quality assurance at Northrop is examined. The use of on-line and library computer graphics systems by the quality assurance personnel enabled the programming of lofting for at-will retrieval. The data is used to inspect master tools check features, castings, forgings, parts with basic moldline features, drawings, and tool design drawings. Lofting requests are made if the files are found to have inadequacies, and quality assurance findings are returned to the requester in hard copy form. Continuous updating of the system is reviewed, and the relevant data for cataloguing and identifying parts and parts surfaces are outlined. A reduction of time spent in inspections of 400% has been achieved with the system. M.S.K.

A82-20277 **Graphics in numerical control - The user's challenge.** J. H. Mabry (Rockwell International Corp., Tulsa, OK). *IEEE Computer Graphics and Applications*, vol. 2, Jan. 1982, p. 45-49.

The use of computer graphics to develop numerical control programs for the aerospace industry, particularly for parts for the Boeing 757, is explored. The user's understanding of the command structure of the graphics system was found to be the critical element in increasing productivity with the CAD/CAM systems. Other productivity gains were obtained by programming commonalities, reviewing the processing requirements to identify the command stream, elimination of operator response where possible, and menu or software revision early in the task. M.S.K.

A82-20278 **The future of integrated CAD/CAM systems - The Boeing perspective.** W. Beeby (Boeing Commercial Airplane Co., Engineering Div., Seattle, WA). *IEEE Computer Graphics and Applications*, vol. 2, Jan. 1982, p. 51, 52, 54-56.

The operations and upgrading of the interactive CAD/CAM system at Boeing for the design and manufacture of aircraft are discussed. The introduction of the system allowed engineering drawings to be used by manufacturing personnel without necessitating face-to-face contact, and the inclusion of lofting diagrams permitted the designers and builders to talk through the system to define changes. An upgrading to three-dimensional representation to enhance the engineering and manufacturing sections of the system is outlined, with stress upon the use of a shared data base. Critical areas of the system are listed as data management, which delineates the product definition data and planning and control data; a geometry engine for manipulating and evaluating the image data; and the communications processing network, which facilitates the rapid transfer of data between any discipline in the plant. M.S.K.

A82-20291 * # **Dilution jet behavior in the turn section of a reverse flow combustor.** S. M. Riddlebaugh (NASA, Lewis Research Center, Cleveland, OH), I. Greber (Case Western Reserve University, Cleveland, OH), and A. Lipshitz. *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0192.* 13 p.

Measurements of the temperature field produced by a single jet and a row of dilution jets issued into a reverse flow combustor are presented. The temperature measurements are presented in the form of consecutive normalized temperature profiles, and jet trajectories. Single jet trajectories were swept toward the inner wall of the turn, whether injection was from the inner or outer wall. This behavior is explained by the radially inward velocity component necessary to support irrotational flow through the turn. Comparison between experimental results and model calculations showed poor agreement due to the model's not including the radial velocity component. A widely spaced row of jets produced trajectories similar to single jets at similar test conditions, but as spacing ratio was reduced, penetration was reduced to the point where the dilution jet flow attached to the wall. (Author)

A82-20293 * # **An experimental study of separated flow on a finite wing.** A. E. Winkelmann (Maryland, University, College Park, MD). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, Albuquerque, NM, Aug. 19-21, 1981, Paper 81-1882.* 21 p. 9 refs. Grant No. NsG-1570.

The flow field associated with the formation of a mushroom shaped trailing edge stall cell on a low-aspect-ratio (AR = 4.0) wing was investigated in a series of low speed wind tunnel tests (Reynolds number based on 15.2 cm chord = 480,000). Flow field surveys of the separation bubble and wake of a partially stalled and fully stalled wing were completed using a hot-wire probe, a split-film probe, and a directional sensitive pressure probe. A new color video display technique was developed to display the flow field survey data. Photographs were obtained of surface oil flow patterns and smoke flow visualization. (Author)

A82-20294 # **Digital avionics - Advances in maintenance designs.** D. W. Mineck (Rockwell International Corp., Collins Air Transport Div., Cedar Rapids, IA). In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers. Conference sponsored by the American Institute of Aeronautics and Astronautics and Institute of Electrical and Electronics Engineers. New York, American Institute of Aeronautics and Astronautics, 1981. 11 p. (AIAA 81-2240)

It is shown that the performance benefits of advanced digital avionics systems can only be realized through the refinement of maintenance techniques. Digital technology permits the cost-effective application of line replaceable unit (LRU) level testing, centralized avionics system monitoring, and fault isolation. It is expected that maintenance designs under development will further reduce costs, and ensure that performance benefits are consistently achieved through high availability. Automatic and interactive ground testing can be realized through the application of maintenance oriented ground rules throughout avionics systems' design and development process, including on-aircraft maintenance of in-flight fault storage and in-flight fault consolidation. In this way, carry-on equipment will be virtually eliminated. O.C.

A82-20296 * # **Piloted simulation of an on-board trajectory optimization algorithm.** D. B. Price (NASA, Langley Research Center, Hampton, VA), A. J. Calise, and D. D. Moerder (Drexel University, Philadelphia, PA). *AIChE, ASME, IEEE, and ISA, Joint Automatic Control Conference, University of Virginia, Charlottesville, VA, June 17-19, 1981, Paper.* 28 p.

This paper will describe a real time piloted simulation of algorithms designed for on-board computation of time-optimal intercept trajectories for an F-8 aircraft. The algorithms, which were derived using singular perturbation theory, generate commands that are displayed to the pilot on flight director needles on the 8-ball. By

A82-20874 * # **Advanced subsonic transport propulsion.** D. L. Nored, C. C. Ciepluch, R. Chamberlin, E. T. Meleason, and G. A. Kraft (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, ASCE, ATRIF, and TRB, International Air Transportation Conference, Atlantic City, NJ, May 26-28, 1981, AIAA Paper 81-0811.* 30 p. 5 refs.

Examination of future subsonic commercial aircraft propulsion trends begins with a brief review of the current NASA Energy Efficient Engine (E3) Project. Included in this review are the factors that influenced the design of these turbofan engines and the advanced technology incorporated in them to reduce fuel consumption and improve environmental characteristics. In addition, factors such as the continuing spiral in fuel cost, that could influence future aircraft propulsion systems beyond those represented by the E3 engines, are also discussed. Advanced technologies that will address these influencing factors and provide viable future propulsion systems are described. And finally, the potential importance of other propulsion system types, such as geared fans and turboshaft engines, is presented. (Author)

A82-20981 **Bolted field repair of graphite/epoxy wing skin laminates.** R. E. Bohlmann, G. D. Renieri (McDonnell Aircraft Co., St. Louis, MO), and M. Libeskind (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Joining of composite materials; Proceedings of the Symposium, Minneapolis, MN, April 16, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 97-116. Contract No. N62269-78-C-0272.

Mechanically fastened field repair techniques have been developed for graphite/epoxy skins damaged at or near substructure members and used to repair AV-8B and F-18 wing skin laminates. Damages of up to 101.6 mm in diameter have been repaired by mechanically fastening a titanium patch to the laminate using blind fasteners in single shear, with access only to the outside surface. The design goal of 0.004 mm/mm for a repaired graphite/epoxy wing skin laminate was attained for static strength and for residual strength tests after four lifetimes of spectrum fatigue. V.L.

A82-20982 **Improving composite bolted joint efficiency by laminate tailoring.** J. R. Eisenmann and J. L. Leonhardt (General Dynamics Corp., Fort Worth, TX). In: Joining of composite materials; Proceedings of the Symposium, Minneapolis, MN, April 16, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 117-130.

An approach to laminate tailoring is presented which makes it possible to uncouple the local bearing capacity from the influence of the laminate axial strain level in a composite bolted joint. This is achieved by partitioning the laminate into two distinct regions: the primary region, which contains a high percentage of 0-deg plies and thus carries a high percentage of the overall axial load, and the bearing region, which contains no 0-deg plies and thus carries only a small portion of the overall axial load. As a result, the bearing region is insensitive to the amount of axial load in the joint and can continue to serve the function of introducing the bolt loads in the laminate even at high axial strains. In validation tests, a 24% increase in weight efficiency and a 60-70% increase in axial strain level were typically obtained when the tailored joint concept was adopted in place of the conventional approach. V.L.

A82-21189 **Airbus Industrie - The year of progress.** K. Regelin. *Interavia,* vol. 37, Jan. 1982, p. 35-39.

At the end of March 1982, the first A310 will take off from Airbus Industrie's Toulouse base. The completion of a one-year flight test program is expected to lead to full certification of the aircraft for airline operations by Mar. 31, 1983. Airbus Industrie claims to have developed the most advanced airliner wing. Compared with the already efficient wing of the A300, the span of the smaller A310 is only 2% shorter. However, the wing area has been reduced by approximately 16%. The resulting higher aspect ratio improves aerodynamic efficiency, while the increased thickness-to-chord ratio reduces weight. Attention is given to the aircraft design, the two-man versus three-man crew issue, the electronic flight instrumentation, the digital Automatic Flight System, the aircraft production plan, design details regarding the three slat sections on each wing, and Airbus Industrie's confidence in further market growth. G.R.

A82-21190 **Boeing's bigger narrowbody.** B. Rek. *Interavia,* vol. 37, Jan. 1982, p. 43-46.

After the termination of 707 production, the biggest production airliner remaining with the classic Boeing six-abreast fuselage is the 180/200-seat 757 twinjet. The first flight of the 757 is scheduled for Feb. 26, 1982. Two engines are currently being considered for use with the 757. Improved technology coupled with a rigorous weight reduction program has made possible significant improvements in fuel efficiency. It is planned to offer a 240,000 lb gross-weight version of the 757 which will be capable of U.S. coast-to-coast range. The single-aisle 757 is regarded as part of a larger program which includes the 767 as well. The 'configuration cab' contains flight deck features which will be common to the 757 and 767. Other common features include the Flight Management System, the Thrust Management Computer, and the Inertial Reference System. Attention is also given to the test program and the 757 market prospects. G.R.

A82-21191 **A new look at the Tupolev Tu-26 'Backfire'.** G. Lafon. *Interavia,* vol. 37, Jan. 1982, p. 78, 79.

The Soviet Air Force has now four types of aircraft with variable-sweep wings in service, including the Sukhoi Su-17/20/22 Fitter and MiG-23/27 Flogger fighters, the Su-24 Fencer strike aircraft, and the Tu-26 Backfire bomber. The characteristics of the Backfire bomber are compared with those of an equivalent design with fixed wings. It is pointed out that the 55 deg swept wing, with a leading edge which goes sonic at Mach 1.75, is not sufficiently swept for supersonic cruising. High sweep must be intended primarily for transonic/supersonic dash. The powerplant is believed to include two reheated Kuznetsov turbofans, as used in the Tu-144 supersonic transport (SST). It is estimated that with an SST powerplant Backfire will be capable to fly at speeds of about Mach 0.85 at sea level, Mach 1.2 at 20,000 ft, and Mach 1.7 at 40,000 ft. Aspects of subsonic performance are also discussed, taking into account a comparison with the U.S. B-1. G.R.

A82-21243 **ALF502 - Plugging the turbofan gap.** R. Whitaker. *Flight International,* vol. 121, Jan. 30, 1982, p. 237-241.

The development history, mechanical design and performance capabilities of the ALF502 turbofan engine are presented. The high-bypass design is based on the T55 turboshaft engine's core, yields low noise and low fuel consumption, and achieves good maintainability by means of a modular construction that comprises separate fan, accessory gearbox, gas producer, and combustor turbine elements. Only three special tools are needed for module changes, and an initial mean time between overhauls of 4000 hours is estimated. Because of the moderate temperatures and pressures for which the engine is designed, it is expected to meet the ICAO's 1983 emission regulations with respect to smoke, CO, hydrocarbons and nitrogen oxides. The engine has been selected for use in the Challenger business aircraft, and is presently employed in the BAe 146. O.C.

A82-21260 **AV-8B Harrier II.** R. Braybrook. *Air International,* vol. 22, Feb. 1982, p. 64-69, 102.

Design improvements, operating characteristics, and performance data of the AV-8B Harrier II V/STOL aircraft are discussed. The Harrier is a joint U.S.-UK development for use by the navies and by the USMC, who have added new combat maneuvers to take advantage of the engine nozzle deflectors for low speed maneuverability. The wing area has been extended to 230 sq ft from the AV-8A 201 sq ft, and the aircraft now has single slotted flaps, a supercritical airfoil, 7500 lb fuel capacity, and carbon fiber main structure, flaps, and ailerons. The nav-attack system includes an ASN-130 inertial navigator, HUD, and AYK-14 mission computer, pod-mounted advanced self-protection system, an all-weather landing system, and an angle-rate bombing system, which uses lasers and TV trackers for locking on a target. Deliveries will begin in Oct. 1983. M.S.K.

A82-21373 * # **We have just begun to create efficient transport aircraft.** D. J. Maglieri and S. M. Dollyhigh (NASA, Langley Research Center, Aeronautical Systems Div., Hampton, VA). *Astronautics and Aeronautics,* vol. 20, Feb. 1982, p. 26-38. 21 refs.

Factors affecting the cost-effectiveness and economics of the air transportation industry are reviewed. The delivery of more fuel-efficient aircraft and eventual total replacement in the 1990's by fleets of advanced aircraft are seen to offset rising fuel costs. Better airport operations are perceived to eliminate fuel-costly delays due to overcrowded runways, lack of available carriers, and maintenance of aircraft in holding patterns. Noise reduction research will lower the lawsuit costs from noise pollution, and the introduction of advanced turbofans for long, short, and medium range flights, advanced commuter planes, and advanced SSTs offering projected 50% increases in current aircraft efficiencies are seen to be limited only by the airlines' ability to provide purchase financing, rather than by a lack of available new technology. M.S.K.

A82-21374 * # **The outlook for advanced transport aircraft.** J. M. Leavens, Jr., R. D. Schaufele (Douglas Aircraft Co., Long Beach, CA), R. T. Jones (NASA, Ames Research Center, Moffett Field, CA), J. E. Steiner (Boeing Co., Seattle, WA), R. Beteille (AirBus Industrie, Blagnac, Haute-Garonne, France), G. A. Titcomb (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT), J. F. Coplin (Rolls-Royce, Ltd., London, England), B. H. Rowe (General Electric Co., Aircraft Engine Group, Cincinnati, OH), D. J. Lloyd-Jones (American Airlines, Inc., Fort Worth, TX), and W. J. Overend (Delta Air Lines, Inc., Atlanta, GA). *Astronautics and Aeronautics*, vol. 20, Feb. 1982, p. 39-62, 79.

The technological advances most likely to contribute to advanced aircraft designs and the efficiency, performance, and financial considerations driving the development directions for new aircraft are reviewed. Fuel-efficiency is perceived as the most critical factor for any new aircraft or component design, with most gains expected to come in areas of propulsion, aerodynamics, configurations, structural designs and materials, active controls, digital avionics, laminar flow control, and air-traffic control improvements. Any component area offers an efficiency improvement of 3-12%, with a maximum of 50% possible with a 4000 m range aircraft. Advanced turboprops have potential applications in short and medium haul subsonic aircraft, while a fuel efficient SST may be possible by the year 2000. Further discussion is devoted to the pivoted oblique wing aircraft, lightweight structures, and the necessity for short payback times. M.S.K.

A82-21375 * # **CAD/CAM approach to improving industry productivity gathers momentum.** R. E. Fulton (NASA, Langley Research Center, Hampton, VA). *Astronautics and Aeronautics*, vol. 20, Feb. 1982, p. 64-70. 18 refs.

Recent results and planning for the NASA/industry Integrated Programs for Aerospace-Vehicle Design (IPAD) program for improving productivity with CAD/CAM methods are outlined. The industrial group work is being mainly done by Boeing, and progress has been made in defining the designer work environment, developing requirements and a preliminary design for a future CAD/CAM system, and developing CAD/CAM technology. The work environment was defined by conducting a detailed study of a reference design process, and key software elements for a CAD/CAM system have been defined, specifically for interactive design or experiment control processes. Further work is proceeding on executive, data management, geometry and graphics, and general utility software, and dynamic aspects of the programs being developed are outlined. M.S.K.

A82-21386 **Airborne lidar measurements of smoke plume distribution, vertical transmission, and particle size.** E. E. Uthe, B. M. Morley, and N. B. Nielsen (SRI International Atmospheric Science Center, Menlo Park, CA). *Applied Optics*, vol. 21, Feb. 1, 1982, p. 460-463. 12 refs. Research supported by SRI International.

Observations were made of a dense smoke plume downwind from a forest fire using the ALPHA-1 two-wavelength downward-looking airborne lidar system. Facsimile displays were derived which depict plume dimensions, boundary layer height, and underlying terrain elevations. Results show significantly greater plume attenuation at 0.53-micron wavelengths than at 1.06-micron wavelengths, which indicates about 0.1-micron mean particle diameters, or the presence of gaseous constituents that absorb the visible radiation. D.L.G.

A82-21391 * **Calculation of sensitivity derivatives in thermal problems by finite differences.** R. T. Haftka and D. S. Malkus (Illinois Institute of Technology, Chicago, IL). *International Journal for Numerical Methods in Engineering*, vol. 17, Dec. 1981, p. 1811-1821. 13 refs. Grant No. NsG-1266.

The optimum design of a structure subject to temperature constraints is considered. When mathematical optimization techniques are used, derivatives of the temperature constraints with respect to the design variables are usually required. In the case of large aerospace structures, such as the Space Shuttle, the computation of these derivatives can become prohibitively expensive. Analytical methods and a finite difference approach have been considered in studies conducted to improve the efficiency of the calculation of the derivatives. The present investigation explores two possibilities for enhancing the effectiveness of the finite difference approach. One procedure involves the simultaneous solution of temperatures and derivatives. The second procedure makes use of the optimum selection of the magnitude of the perturbations of the design variables to achieve maximum accuracy. G.R.

A82-21474 **Gateway diversity and competition in international air transportation.** W. B. Tye (Putnam, Hayes and Bartlett, Inc., Cambridge, MA). *Transportation*, vol. 10, Dec. 1981, p. 345-356.

Because of the existence of 'limited designation' gateways, i.e., gateways for international air travel where entry by U.S. flag carriers is limited (in many cases to only one carrier), the U.S. Civil Aeronautics Board (CAB) has announced a policy of 'gateway competition'. This policy seeks to maximize inter-gateway competition as a goal of the carrier selection process. The paper reviews the rationale and history of this policy and the economic principles of gateway competition. After addressing exceptions where gateway competition does not enhance competitive goals, the issue of how to enforce the credibility of the bidding process in route awards is addressed. The paper concludes by identifying circumstances where competitive objectives are not advanced through application of the principal gateway competition. (Author)

A82-21586 **Institute of Navigation, Annual Meeting, 36th, U.S. Naval Postgraduate School, Monterey, CA, June 23-26, 1980, Proceedings.** Washington, DC, Institute of Navigation, 1981. 143 p. Members, $30.; nonmembers, $35.

Papers are presented on the optimal processing of GPS signals, a perspective on the civil use of GPS, the application of strapdown inertial technology to attitude and heading reference system requirements, the emerging need for improved helicopter navigation, and flight control strategies for performance computers. Attention is also given to a systems approach to the design of wind shear avionics, an empirical investigation of an evaluation of Loran-C for nonprecision approach applications, the GPS evaluator, and calibrated and uncalibrated inertial navigation system performance in valid and jammed GPS environments. B.J.

A82-21587 # **Calibrated and uncalibrated inertial navigation system performance in valid and jammed global positioning system environments.** A. J. Brockstein and R. J. Grethel (Litton Industries, Guidance and Control Systems Div., Woodland Hills, CA). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 2-10. 10 refs.

INS performance improvement that can be obtained in a jammed environment after calibration of INS instruments with GPS is compared with uncalibrated INS performance. In addition, gimbaled vs. strapdown INS performance is compared for two trajectories (field test conditions) during jammed and valid operations. It is shown that INS performance can be significantly enhanced during extended periods of GPS outage by prejam INS calibration using GPS. In addition, it is shown that strapdown systems are more difficult to calibrate than gimbaled systems since the major position contributors (gyros) are less observable for a maneuvering trajectory. In addition, the lack of gravity compensation in the strapdown system causes the gyro g-sensitive drift effect to be a major error source. B.J.

A82-21588 # **The Global Positioning System Evaluator.** S. Z. Stein (Intermetrics, Inc., Dayton, OH) and G. Pennett (USAF, Wright-Patterson AFB, OH). In: Institute of Navigation, Annual point noise source impinging on a cylinder of heated flow in which the temperature and velocity are uniform across the cross section of the jet. The shielding jet is infinite in extent along the jet axis and the radius of the jet is constant. The analytical model was compared to experimental data for a point noise source impinging on an ambient temperature, subsonic jet and on a subsonic simulated hot jet using helium as the flow medium. Results of these comparisons are discussed. M.D.K.

N82-16802*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING Semiannual Progress Report
Carl H. Gerhold 30 Jun. 1981 26 p refs
(Grant NAG1-11)
(NASA-CR-165103) Avail: NTIS HC A03/MF A01 CSCL 20A

Development of jet noise source model, and comparison to experiments with a point noise source are summarized. The refinement of the noise source is expected to resolve discrepancies noted between previous analytical results with a point noise source model and experimental results for twin-jet shielding. Comparison of the analytical model with experimental program which include shielding of a point noise source by a jet and twin jet shielding are also made. The comparisons should serve to define more completely the mechanisms of shielding. M.D.K.

N82-16803*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING Annual Progress Report
Carl H. Gerhold 31 Dec. 1980 38 p refs
(Grant NAG1-11)
(NASA-CR-165104) Avail: NTIS HC A03/MF A01 CSCL 20A

An analytical model a three-dimensional model, of twin-jet shielding, consisting of a point noise source impinging on a cylinder of heated flow in which the temperature and flow velocity are uniform across the cross-section is discussed. Wave equations are given for the regions outside the flow and within the flow cylinder and solutions are matched at the jet boundary under the conditions of continuity of pressure and continuity of the vortex sheet. The model was analyzed to identify mechanisms of transmission and diffraction which control sheilding in the shadow of the shielding jet. It was found that in the zone of the shadow region dominates, shielding is relatively insensitive to variations of such parameters as Mach Number and spacing ratio, but in the zone in which diffraction dominates, shielding is more sensitive to variations in Mach Number, jet temperature and spacing ratio. M.D.K.

N82-16804*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING Semiannual Progress Report
Carl H. Gerhold 6 Jun. 1980 18 p refs
(Grant NAG1-11)
(NASA-CR-165105) Avail: NTIS HC A02/MF A01 CSCL 20A

The development of an analytical model, an aircraft noise prediction computer program, to estimate the shielding of one jet by an adjacent jet in a twin jet configuration, is discussed. Noise estimations included consideration not only of noise sources on the aircraft, but also of the propagation path between source and receiver. A three-dimensional case is considered in which noise source is a discrete frequency point source at rest with respect to the jet axis. The shielding jet is assumed to be a cylinder of heated flow in which the temperature and flow velocity profiles are constant across the jet. The effect on shielding of the orientation of the emitting jet with respect to the shielding jet was investigated. Forward and backward scattering phenomena as well as the influence of jet flow speed were also investigated. M.D.K.

N82-16805*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING DEVELOPMENT OF A 3-DIMENSIONAL MODEL Progress Report
Carl H. Gerhold 4 Nov. 1980 24 p refs Sponsored by NASA
(NASA-CR-165106) Avail: NTIS HC A02/MF A01 CSCL 20A

The solution for a point source impinging on a cylinder of heated flow is presented. The indefinite integral is solved approximately using a saddle of point method. Comparison of the three-dimensional model to a previously obtained two-dimensional model of twin jet noise indicate the the approximate solution of the integral is valid. The model was analyzed to differentiate among the mechanims of shielding. Zone in which diffraction and transmission dominate are identified. The model was found to compare to experimental shielding results. M.D.K.

N82-16806*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
ANALYTICAL STUDY OF TWIN-JET SHIELDING TWO-DIMENSIONAL MODEL
Carl H. Gerhold 15 Aug. 1980 17 p refs
(Grant NAG1-11)
(NASA-CR-165107) Avail: NTIS HC A02/MF A01 CSCL 20A

The development of an analytical model to estimate the shielding of one jet by an adjacent jet in a twin jet configuration is discussed in relation to aircraft generated noise. The azimuthal redistribution of sound defining the shadow zone is investigated. Wave equations were solved in the plane normal to the jet axis to estimate the diffraction and reflection of sound by a heated, cylindrical jet. Thus, the noise source considered is essentially a line source assumed to emit at discrete frequency and at rest with respect to the shielding jet which is assumed to be a cylinder of heated flow in which the temperature is constant across the jet. Results show that the sound pressure decreases rapidly with frequency beyond the onset of the shielding to a minimum value. Results also show that increasing the spacing between the source and the jet shifts the curves toward higher frequencies. M.D.K.

N82-16807*# Bolt, Beranek, and Newman, Inc., Canoga Park, Calif.
COMMUNITY SENSITIVITY TO CHANGES IN AIRCRAFT NOISE EXPOSURE Final Report
S. Fidell, R. Horonjeff, S. Teffeteller, and K. Pearsons NASA Dec. 1981 122 p refs
(Contract NAS1-14611)
(NASA-CR-3490; BBN-4212) Avail: NTIS HC A06/MF A01 CSCL 20A

Interviews were conducted in the vicinity of Burbank Airport during a four month period during which a counterbalanced series of changes in aircraft noise exposure occurred due to runway repairs. Another interview was undertaken approximately one year after completion of the initial runway repairs. Noise measurements were made in conjunction with administration of a brief questionnaire to a near exhaustive sample of residents in four airport neighborhoods. The magnitude and direction of change of annoyance with aircraft noise exposure corresponded closely to the actual changes in physical exposure. Estimates were made of time constants for the rate of change of attitudes toward aircraft noise. S.L.

N82-16808*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NOISE OF THE SR-3 PROPELLER MODEL AT 2 DEG AND 4 DEG ANGLE OF ATTACK
James H. Dittmar and Robert J. Jeracki Dec. 1981 30 p refs
(NASA-TM-82738; E-1051) Avail: NTIS HC A03/MF A01 CSCL 20A

The noise effect of operating supersonic tip speed propellers at angle of attack with respect to the incoming flow was determined. Increases in the maximum blade passage noise were observed for the propeller operating at angle of attack. The noise increase was not symmetrical with one wall of the wind tunnel having significantly more noise increase than the other wall. This was apparently the result of the rotational direction of the propeller. The lack of symmetry of the noise at angle of attack to the use of oppositely rotating propellers on opposite sides of an airplane fuselage as a way of minimizing the noise due to operation at angle of attack. J.D.H.

N82-16809*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A SHOCK WAVE APPROACH TO THE NOISE OF SUPERSONIC PROPELLERS
James H. Dittmar and Edward J. Rice Dec. 1981 19 p refs
(NASA-TM-82752; E-1068) Avail: NTIS HC A02/MF A01

CSCL 20A

To model propeller noise expected for a turboprop aircraft, the pressure ratio across the shock at the propeller tip was calculated and compared with noise data from three propellers. At helical tip Mach numbers over 1.0, using only the tip shock wave, the model gave a fairly good prediction of the noise for a bladed propeller and for a propeller swept for aerodynamic purposes. However for another propeller, which was highly swept and designed to have noise cancellations from the inboard propeller sections, the shock strength from the tip over predicted the noise. In general the good agreement indicates that shock theory is a viable method for predicting the noise from these supersonic propellers but that the shock strengths from all of the blade sections need to be properly included. M.G.

N82-16810*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.
PREDICTION OF SOUND RADIATION FROM DIFFERENT PRACTICAL JET ENGINE INLETS Semiannual Status Report, 1 Jun. 1981 - 1 Dec. 1981
Ben T. Zinn and William L. Meyer 1982 127 p refs
(Grant NAG3-67)
(NASA-CR-165120) Avail: NTIS HC A07/MF A01 CSCL 20A

The computer codes necessary for this study were developed and checked against exact solutions generated by the point source method using the NASA Lewis QCSEE inlet geometry. These computer codes were used to predict the acoustic properties of the following five inlet configurations: the NASA Langley Bellmouth, the NASA Lewis JT15D-1 Ground Test Nacelle, and three finite hyperbolic inlets of 50, 70 and 90 degrees. Thirty-five computer runs were done for the NASA Langley Bellmouth. For each of these computer runs, the reflection coefficient at the duct exit plane was calculated as was the far field radiation pattern. These results are presented in both graphical and tabular form with many of the results cross plotted so that trends in the results verses cut-off ratio (wave number) and tangential mode number may be easily identified. Author

N82-16834# Pacific Northwest Lab., Richland, Wash.
DEVELOPMENT OF IN-CAN MELTING PROCESS AND EQUIPMENT, 1979 AND 1980
L. L. Petkus, D. E. Larson, W. J. Bjorklund, and L. K. Holton
Sep. 1981 46 p refs
(Contract DE-AC06-76RL-01830)
(DE82-001050; PNL-3957) Avail: NTIS HC A03/MF A01

Nonradioactive process testing continued with the in-can melter as part of an investigation into the applicability of this vitrification process to various calcined high level and incinerator ash radioactive wastes. How waste composition and canister fins affect in-can melter capacity and how waste composition affects glass quality were examined. Process performance proved to be generally satisfactory. Pilot scale in-can melter runs were performed with synthetic, nonradioactive, high level wastes to produce eight canisters of glass. The synthetic waste processed included high level wastes as well as transuranic ash waste. Full scale in-can melter runs using nonradioactive materials were also conducted, producing ten canisters of glass. In the full scale in-can melter furnace the baffles separating the six heating zones were removed because of baffle warping. A remotely operated section connecting the spray calciner to the canister was tested. Some problems were encountered with calcine plugging. DOE

N82-16850# HTL Industries, Inc., Duarte, Calif. Advanced Technology Div.
TEST AND EVALUATION OF UV FIBER OPTICS FOR APPLICATION FOR AIRCRAFT FIRE DETECTOR SYSTEMS Final Report, 23 May 1980 - 23 Mar. 1981
Dayton, Ohio AFWAL Jun. 1981 58 p refs
(Contract F33615-80-C-2042; AF Proj. 3048)
(AD-A106129; AFWAL-TR-81-2049) Avail: NTIS HC A04/MF A01 CSCL 17/5

It was found that in the U.V. solar blind region, there are severe limitations on the field of view obtainable in Fiber Optic coupled systems. These restrictions are such as to make further consideration of the wide angle system concept unprofitable. This effectively limits the use of such systems in fire detection to applications where the precise location of a flame can be predicted. It is concluded that the performance of optical fibers in the U.V. solar blind wavelengths is such that the trade-off gains proposed in AFAPL-TR-78-84 cannot be realized in practice. Author (GRA)

N82-16927*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. Management Services Office.
FISCAL YEAR 1981 SCIENTIFIC AND TECHNICAL REPORTS, ARTICLES, PAPERS, AND PRESENTATIONS
Sarah S. Thacker, comp. Oct. 1981 70 p
(NASA-TM-82446) Avail: NTIS HC A04/MF A01 CSCL 05B

This bibliography lists approximately 503 formal NASA technical reports, papers published in technical journals, and presentations by MSFC personnel in FY-1981. It also includes papers of MSFC contractors. Citations announced in the NASA scientific and technical information system are noted. N.W.

N82-17061*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
RESEARCH AND TECHNOLOGY ANNUAL REPORT, 1981 Annual Report, 1981
1981 44 p
(NASA-TM-81333; A-8744) Avail: NTIS HC A03/MF A01 CSCL 05A

Various research and technology activities at Ames Research Center are described. Highlights of these accomplishments indicate the Center's varied and highly productive research efforts for 1981. Author

N82-17062# Air Force Flight Dynamics Lab., Wright-Patterson AFB, Ohio.
FLIGHT DYNAMICS TECHNOLOGY DEVELOPMENT: STRUCTURES AND DYNAMICS, VEHICLE EQUIPMENT/SUBSYSTEMS, FLIGHT CONTROL AND AEROMECHANICS
Dec. 1980 87 p Supersedes AFFDL-TR-79-3133
(AD-A096636; AFWAL-TR-80-3144; AFFDL-TR-79-3133) Avail: NTIS HC A05/MF A01 CSCL 05/1

The document presents an overview of the four Technical Planning Objectives (TPO) and supporting data for each. These are extracted from the technical plan of the Flight Dynamics Laboratory (FDL). Information is largely based on FDL fiscal 1982 technology plan omitting specific funding and timing information of an 'Official Use Only' nature. Technical objectives are described for the technical areas of Structures and Dynamics, Vehicle Equipment/Subsystems, Flight Control and Aeromechanics. Points of contact for more information in each of the areas are identified. GRA

N82-17066# Institute for Defense Analyses, Arlington, Va. Program Analysis Div.
BUILT-IN-TEST EQUIPMENT REQUIREMENTS WORKSHOP. WORKSHOP PRESENTATION Final Report, 1 Oct. 1980 - 28 Feb. 1981
Aug. 1981 235 p refs Workshop held at Arlington, Va., 11-13 Feb. 1981
(Contract MDA903-79-C-0320)
(AD-A107842; AD-E500460; IDA-P-1600) Avail: NTIS HC A11/MF A01 CSCL 09/3

A workshop was held for the purpose of assessing progress and problems in specifying and testing Built-In-Test (BIT) used in complex electronic equipment. The workshop's principal recommendation is that the current specification and test approach be broadened to include all capabilities associated with the detection and isolation of faults. Current practices generally address only a narrow subset of these capabilities, namely, BIT. The workshop participants defined this broad capability as '100 Percent Diagnostics.' The diagnostic capability is considered to have two components--'automatic' and 'manual.' The automatic component consists of BIT or semi-automatic BIT with technical manuals, while the manual component consists of personnel using logic, external test equipment and/or manual test procedures. Observations on current experience with BIT, recommendations to improve specification and testing of '100 Percent Diagnostics' that can be put into practice in the near term, and proposed research areas are presented. GRA

N82-17086# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
TACTICAL AIRBORNE DISTRIBUTED COMPUTING AND NETWORKS
Oct. 1981 415 p refs Partly in ENGLISH and FRENCH Meeting held in Roros, Norway, 22-25 Jun. 1981
(AGARD-CP-303; ISBN-92-835-0302-3) Avail: NTIS HC A18/MF A01

infrared (IR) emission at part load, due to the design of the IR suppressor for the same exhaust temperature at maximum power. The life-cycle costs of a future fleet of attack helicopters equipped with regenerative engines can be lower than with conventional engines. J.D.H.

N82-17213# Westland Helicopters Ltd., Hayes (England).
LUBRICATION BREAKDOWN BETWEEN GEAR TEETH
B. A. Shotter *In* AGARD Helicopter Propulsion Systems Sep. 1981 11 p
Avail: NTIS HC A13/MF A01

Damage to gear teeth attributable to lubrication failure is an important failure mode. Detailed observations of the early stages of breakdown suggest that one may not be dealing with a single process: hence great care is necessary when drawing conclusions from observing a damaged pair of gears. A study of a number of these critical areas and discussion about others highlights the complexity of the problem. J.D.H.

N82-17214# Sikorsky Aircraft, Stratford, Conn.
ADVANCED TRANSMISSION COMPONENT DEVELOPMENT
Kenneth M. Rosen and Harold K. Frint *In* AGARD Helicopter Propulsion Systems Sep. 1981 17 p refs

Avail: NTIS HC A13/MF A01

Design innovations in helicopter gearbox development which permit high temperature operation at increased speeds without degrading strength or weight goals are discussed. One avenue of investigation, which shows promising strength or weight advantages, is high contact ratio gearing. The means taken to obtain a high contact ratio tends to produce an inherently weaker tooth and reliance must be placed on the multiple load-sharing feature of this design to achieve an advantage over low contact ratio gears. The appropriate consideration which must be addressed in the design stage to achieve optimum results is described. To provide high temperature capability, two UH-60A helicopter main transmission housings were fabricated from a stainless steel alloy to replace the conventional magnesium alloy casing. Design details and fabrication procedures are discussed. J.D.H.

N82-17215# Costruzioni Aeronautiche Giovanni Agusta S.p.A., Gallarate (Italy).
DESIGN CRITERIA OF THE A 129 HELICOPTER DRIVE SYSTEM
A. Garavaglia and G. Gattinoni *In* AGARD Helicopter Propulsion Systems Sep. 1981 11 p

Avail: NTIS HC A13/MF A01

The design philosophy of the Agusta-A 129 drive system which is developed to meet the modern requirements for a light helicopter in the antitank role with night and day fighting capability are discussed. The stringent requirements of system layout and achieving low weight, high life, maximum reliability, survivability and ballistic tolerance, through integrated system design, modular concepts, use of redundant system and dry run capability are outlined. E.A.K.

N82-17216# Service Techniques des Programmes Aeronautiques, Paris (France).
HELICOPTER DEVELOPMENT IN FRANCE [LE DEVELOPPEMENT DES HELICOPTERES EN FRANCE]
Daniel Berthault *In* AGARD Helicopter Propulsion Systems Sep. 1981 9 p In FRENCH

Avail: NTIS HC A13/MF A01

For the French helicopter industry, the last two decades correspond to a period of rapid growth. The national armed forces were supplied with significant quantities of good quality military equipment well adapted to their operational objectives. Considerable successes were met in the sale for exploration of military helicopters as well as other machines for civilian use, which were developed by taking account of market requirements. These were often classed in a very favorable manner in relation to the products of competitors. The essential characteristics of helicopter development in France during this period are traced. The lines of direction and the modality of action taken by various public services in this regard are analyzed. By defining future needs and the centers of action, perspectives for the future are outlined. Transl. by A.R.H.

N82-17217# Societe Nationale Industrielle Aerospatiale, Marignane (France.)
HELICOPTER AIR INLETS [ENTREES D'AIR D'HELICOPTERES]
A. Vuillet *In* AGARD Helicopter Propulsion Systems Sep. 1981 9 p refs In FRENCH

Avail: NTIS HC A13/MF A01

Because of engine architecture, air inlets on low and medium tonnage helicopters are located behind the rotor head, which makes feeding very difficult. This is particularly the case of the Ecureuil AS 350 and the Dauphin SA 365 which are equipped with new generation engines. These turbines have axial or annular intakes behind which the reductor is located beside either the blast pipe or the compressor. An indepth study of the air intakes from the project stage can permit their design with a minimum of unlucky repercussions on the power supplied by the engine, on the layer of the device, and on risks to pumping. For this reason, such a study is needed to reduce the delays and costs of operating such an intake in flight. Methods used at Aerospatial and results obtained on different devices are described. Transl. by A.R.H.

N82-17218# Westland Helicopters Ltd., Yeovil (England).
INTAKE DESIGN WITH PARTICULAR REFERENCE TO ICE PROTECTION AND PARTICLE SEPARATORS
P. A. H. Brammer and D. J. Rabone *In* AGARD Helicopter Propulsion Systems Sep. 1981 13 p ref

Avail: NTIS HC A13/MF A01

Total environmental protection for helicopter engines is discussed. The problems associated with different environments and intake systems which are used to give protection against particular environments are outlined. Three intake systems for evaluation in natural environments are proposed. E.A.K.

N82-17219# Societe Nationale Industrielle Aerospatiale, Marignane (France.)
THE DISTRESS REGIME ON THE BIMOTORED HELICOPTER [REGIME DE DETRESSE SUR HELICOPTERE BIMOTEUR]
J. P. Dedieu, M. Russier, and H. Dabbadie (Societe Turbomeca, Bordes, France) *In* AGARD Helicopter Propulsion Systems Sep. 1981 8 p refs In FRENCH

Avail: NTIS HC A13/MF A01

The trend toward bimotorization of civil and military helicopters raises the question of choice of power level for each engine in order to obtain acceptable performance in case of engine trouble, particularly at very low speed. The use of a distress regime to obtain a very high power level, for a short time, once in the life of an engine seems to be an interesting and promising approach. The relation between the levels of distress power and parameters related to the use of the helicopter, takeoff, mass, ceiling, and operating cost are considered for the case of a bimotored helicopter of average weight. The perspectives of homologization and the civil certification of such a regime on real technology engines are examined. Transl. by A.R.H.

N82-17220# Boeing Vertol Co., Philadelphia, Pa.
ENGINE/DRIVE/AIRFRAME COMPATIBILITY: A WAY OF LIFE
Carl Albrecht *In* AGARD Helicopter Propulsion Systems Sep. 1981 7 p refs
Avail: NTIS HC A13/MF A01

Engine/drive/airframe compatibility in development stages or during production of a new design were studied. Various compatibility encounters on Boeing Vertol helicopters, analyses, solutions as effected by current technology and engine/airframe manufacturer relationships and dynamic interface items are discussed. E.A.K.

N82-17221# Pisa Univ. (Italy). Ist. di Macchine.
PROBLEMS OF ENGINE RESPONSE DURING TRANSIENT MANEUVERS
Dino Dini *In* AGARD Helicopter Propulsion Systems Sep. 1981 14 p refs
Avail: NTIS HC A13/MF A01

Helicopter transition flight regime and extreme flight maneuvers which determine abrupt variation of the rotor drag torque during each revolution, and the corresponding effects on the engine are discussed. Repeated surging and the attendant transient torsional loads from the engine cause damage to the airframe components. The angular rotor acceleration, cyclically variable, influences the turbine gas producer rotor speed, introducing flow distortions and aeromechanical effects in all the engine. It is found that periodic and inertial blade loading has serious consequences to discs and shaft to which the blades are attached. The higher harmonics of the excitation over the discs provokes relevant flexural modes of forced vibration. Operation in transient rating with pitch increase or decrease has the greatest effect on the helicopter flight performance, owing to the power application capability and the fuel control system adaptability. It is shown that to obtain sufficient engine/airframe dynamic compatibility, aircraft developments have to incorporate technical advances, which include harmonic integrated controls for propulsion and flight systems. E.A.K.

N82-17222# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
HELICOPTER PROPULSIONS SYSTEMS. 1: VIBRATION PREVENTION SYSTEMS ON HELICOPTERS 2: PROBLEM OF NOISE IN THE CABIN
Gerard Genoux and Henri-James Marze *In* AGARD Helicopter Propulsion Systems Sep. 1981 19 p refs

Avail: NTIS HC A13/MF A01

Two different facets of the propulsion system/structure interaction are presented. The first interaction deals with low frequency vibration associated with the operation of the main rotor. These problems are either mechanical material fatigue and stressing or related to comfort. Implementation for reduction excitations and filtration of their transfer from the source to the cabin are described. The second interaction type is cabin noise associated with the operation of the reduction gear box. The vibratory energy generated at the gears propagates all the way to the passengers via the air and the structure. Cutting the intensity of transmission noise sources, the energy transfer between such sources and the structure and the energy radiation from the structure to the passengers is discussed. E.A.K.

N82-17223# Rolls-Royce Ltd., Leavesden (England).
AN ALTERNATIVE APPROACH TO ENGINEERING STRUCTURES USING MONITORING SYSTEMS
D. Lewis *In* AGARD Helicopter Propulsion Systems Sep. 1981 11 p
Avail: NTIS HC A13/MF A01

The micro processor based engine monitoring system (EMS) which reevaluates the rating structure and presents limitations to the pilots is discussed. The EMS system allows the achievement of a better relationship between the demonstrated capability of the engine and the authorized release for in service use. This is a first step to be followed later by a change of the qualification test to a more representative form in which the EMS gives a more tangible link between bench test and customer operation. This allows better use of the engine to be made for the short time/high power requirements giving a more efficient engine performance at cruise conditions. E.A.K.

N82-17224*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPONENT RESEARCH FOR FUTURE PROPULSION SYSTEMS
C. L. Walker (Army Propulsion Lab., Cleveland, Ohio), G. J. Weden (Army Propulsion Lab., Cleveland, Ohio), and J. Zuk *In* AGARD Helicopter Propulsion Systems Sep. 1981 12 p refs

Avail: NTIS HC A13/MF A01 CSCL 21E

The factors affecting the helicopter market for the past, present, and future are reviewed. Acquisition cost, mission reliability, life cycle cost and civil and military aspects are reviewed. The potential for advanced vehicle configurations with substantial improvements in energy efficiency, operating economics, and characteristics to satisfy the demands of the future market are identified. Advanced propulsion systems required to support these vehicle configurations and the component technology for the engine systems are discussed. The selection of components in areas of economics and efficiency is considered. E.A.K.

N82-17225# Ministry of Defence, Bonn (West Germany).
FUTURE REQUIREMENTS FOR HELICOPTER PROPULSION SYSTEMS
H.-G. Bree and G. Backmann *In* AGARD Helicopter Propulsion Systems Sep. 1981 13 p refs

Avail: NTIS HC A13/MF A01

The measurements for single or twin engine systems are discussed. The trend to more sophisticated engines is reviewed in the light of diminishing resources of materials and fuel. Expected future economic conditions make it mandatory to counteract the increase of life cycle cost experienced in most of today's military systems. Means to reduce LCC are discussed. E.A.K.

N82-17226# National Aeronautical Establishment, Ottawa (Ontario). Flight Research Lab.
AN INVESTIGATION OF MULTI-AXIS ISOMETRIC SIDE-ARM CONTROLLERS IN A VARIABLE STABILITY HELICOPTER
M. Sinclair and M. Morgan Aug. 1981 25 p ref
(AD-A106759; NAE-LR-606; NRC-19629) HC A02/MF A01 CSCL 01/4

The test aircraft was the NAE Airborne Simulator, an extensively modified Bell Model 205A-1, and the evaluation flights encompassed a wide range of demanding tasks from hover maneuvering and transitions to cruising flight, to nap-of-the-earth flight and precision IFR tracking. The isometric control systems included several two-handed and one-handed configurations with force-pedals for directional control, and one fully-integrated system which provided full control of the helicopter with either hand. T.M.

N82-17227# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Electrical Computer and Systems Engineering.
PARALLEL COMPUTATION FOR DEVELOPING NONLINEAR CONTROL PROCEDURES Final Report, 1 Sep. 1977 - 30 Sep. 1979
Howard Kaufman and Richard Travassos Jul. 1981 238 p refs
(Grant AF-AFOSR-3418-77; AF Proj. 2307)
(AD-A107914; AFWAL-TR-81-3016) Avail: NTIS HC A11/MF A01 CSCL 09/2

Efforts since 1 October 1978 have been concerned with the application of the developed parallel optimization procedures to the design of non-linear flight control systems. Consideration has been given to the advantages to be gained from the direct use of the non-linear equations of motion and to the potential for rapid on-line optimization in response to tracked parameter changes and/or changes in the mission objectives. To date, based upon the non-linear longitudinal equations for the F-8, it has been shown that parallel optimization procedures alone can reduce the time required for optimization by at least 30% and that the direct use of the nonlinear (rather then the linearized) equations of motion does indeed improve attitude control. A study of further incorporation of parallelism into the basic utility routines such as integration and matrix manipulation has shown that the convergence time for a representative optimal control computation can be reduced by a factor of 20. Thus, it was concluded that incorporation of parallel computers might indeed permit online control computation and/or adaptation. To this effect possible architectural structures for such computers have also been studied. GRA

N82-17228*# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering and Mechanics.
SCALE-MODEL STUDIES FOR THE IMPROVEMENT OF FLOW PATTERNS OF A LOW-SPEED TUNNEL Final Report, 1 Mar. - 31 May 1981
P. Stephen Barna Jan. 1982 46 p refs
(Grant NsG-1563)
(NASA-CR-169413) Avail: NTIS HC A03/MF A01 CSCL 14B

Parameters affecting the performance of a scale model V/STOL wind tunnel were measured. These included: (1) static pressure variation around the closed tunnel circuit as affected by the application of various screens; (2) pressure rise and radial distribution of flow through the fan; (3) variation of screen parameters and screen location affecting the flow; and (4) effects of multiple screens on the velocity distribution in the fourth diffuser. In these tests the fan was driven through a long shaft by an externally situated 11,190-W (15-HP) motor equipped to turn at 4 speeds. B.W.

N82-17229# Mitre Corp., McLean, Va.
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16. Abstract

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- *International Aerospace Abstracts (IAA).*

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provides sufficient ground clearance; the use of gas turbine propulsive units, interior noise attenuation; and additional communication linkages. The weight of the helicopter and the diameter of its rotor must also be determined. As an example, the German BK 117 and BO 105 rescue helicopters are discussed in detail; the necessary mobile and standard equipment and instrumentation for these aircraft are illustrated. J.F.

A82-19021 **Aircraft for secondary long range emergency ambulance flight.** K. J. J. Waldeck and G. B. J. Bramer (Algemeene Nederlandsche Wielrijders Bond, The Hague, Netherlands). In: Aeromedical evacuation; Results, analysis, developments; International Aeromedical Evacuation Congress, 1st, Munich, West Germany, September 16-19, 1980, Reports. Munich, Allgemeiner Deutscher Automobile-Club, 1981, p. 460-463.

The primary aim for medical transport today is mobile intensive treatment and care. Rules and directives for medical assistance in flight must therefore be developed, and an ambulance for long-range emergency flight must be designed. This includes the need for special equipment, such as a floating stretcher, which will protect the body of the patient against accelerations with frequencies, corresponding with the natural frequencies of parts of the body and organs. The Fokker F-27 Friendship turboprop from Holland has been converted into an ambulance aircraft with the primary function of in-flight intensive treatment and care. The helicopter features three compartments for (1) the patient and medical equipment; (2) the medical personnel; and (3) the passengers. The F-27 has a large front cargo door with lift installation and a communication area to maintain radio contact with a ground station for medical purposes. The whole medical system can be loaded into the aircraft on pallets, thus enabling every F-17 fitted with a front cargo door to be converted into an ambulance-aircraft within a short period. J.F.

A82-19061 # **An application of total synthesis to robust coupled design.** M. K. Sain, R. M. Schafer, and K. P. Dudek (Notre Dame, University, Notre Dame, IN). In: Annual Allerton Conference on Communication, Control, and Computing, 18th, Monticello, IL, October 8-10, 1980, Proceedings. Urbana, IL, University of Illinois, 1980, p. 386-395. 10 refs. Contract No. N00014-79-C-0475.

Total synthesis techniques for the control of linear multivariable systems are module theoretic methods aimed at bottom line design, wherein the designer selects at the outset the control action and system response characteristics which will be attained. This selection is made from the class having associated with it the possibility of an internally stable feedback realization. In practice, however, such realizations are normally carried out with decentralized dynamics - or fixed structure. Moreover, they must be achieved in such a way that plant parameter variation does not materially inhibit the nominal filter responses. This paper reports on the extension of the Total Synthesis Problem (TSP) concept to robust feedback realizations of fixed structure. An example from turbojet engine data illustrates the concepts. (Author)

A82-19065 # **The use of adaptive control for helicopter trajectories in search operations.** A. Chacón, M. Azagoury, B. Fernández (Universidad Simón Bolívar, Caracas, Venezuela), R. Padilla, and C. Padilla (Instituto Venezolano de Investigaciones Científicas, Caracas, Venezuela). In: Annual Allerton Conference on Communication, Control, and Computing, 18th, Monticello, IL, October 8-10, 1980, Proceedings. Urbana, IL, University of Illinois. 1980, p. 633-642.

An effective and successful search operation by helicopter requires close tracking of predetermined trajectories defined by the characteristics of the terrain and the prior information available to the search party. We investigate here the design of an adaptive controller such that the helicopter follows a predetermined trajectory in a horizontal plane. A model reference control approach is used. Simulation results are given to illustrate the behavior of the controller. (Author)

A82-19069 # **Broader bandwidth for thin conformal antennas.** K. D. Arkind (Sanders Associates, Inc., Nashua, NH). *Astronautics and Aeronautics,* vol. 20, Jan. 1982, p. 31-33.

Current broadband design technology for thin arrays is described. The ability now exists to analyze array concepts with arbitrary element locations and to use printed circuit antenna concepts, which yields minimum drag on a vehicle surface and reduces the cost of complex array designs. A tee-fed-slot design is described which offers 10-20 times the bandwidths of a similar microstrip counterpart, and is noted to employ layered construction. The array antenna is suggested for applications in ECM environments for radar and communications. M.S.K.

A82-19071 * # **On the track of practical forward-swept wings.** T. J. Hertz, M. H. Shirk (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH), R. H. Ricketts (NASA, Langley Research Center, Hampton, VA), and T. A. Weisshaar (Purdue University, West Lafayette, IN). *Astronautics and Aeronautics,* vol. 20, Jan. 1982, p. 40-52. 30 refs.

Structural laminates which comprise wing-cover skins for forward swept winged aircraft are examined. The laminates are themselves composed of lamina arranged in a symmetrical and unbalanced fashion. The fibers are oriented so that no fiber has a counterpart in the same ply which is at an exact anti-angle to itself. The laminate orientation creates a wash-out in a forward swept wing and alleviates aeroelastic loading. Further discussion is devoted to center-of-pressure movement, flutter behavior, aeroelasticity and aeroelastic divergence, and wind tunnel testing of aerodynamically tailored wings. It is found that rotating the laminate to increase the divergence dynamic pressure decreases strain under aerodynamic loading. Flight tests with three models are reported, and it is concluded that divergence can be avoided by the use of an efficient composite structure. M.S.K.

A82-19195 **A simplified wing procedure in connection with the lifting line theory and the doublet-lattice method (Ein vereinfachtes Tragflächenverfahren in Verbindung mit der Traglinientheorie und der Doublet-Lattice Methode).** R. Dziurzynski and M. Nowak (Polska Akademia Nauk, Instytut Podstawowych Problemow Techniki, Warsaw, Poland). *(Gesellschaft für angewandte Mathematik und Mechanik, Wissenschaftliche Jahrestagung, Berlin, West Germany, Apr. 8-11, 1980.) Zeitschrift für angewandte Mathematik und Mechanik,* vol. 61, Apr. 1981, p. T 145, T 146. In German.

A82-19197 **Use of high conical flow theory for the determination of the pressure distribution on the wave rider and its agreement with experimental results for supersonic flow.** A. Nastase and H. Stahl (Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). *(Gesellschaft für angewandte Mathematik und Mechanik, Wissenschaftliche Jahrestagung, Berlin, West Germany, Apr. 8-11, 1980.) Zeitschrift für angewandte Mathematik und Mechanik,* vol. 61, Apr. 1981, p. T 165-T 168. 13 refs.

The considered wave rider is a delta wing which is designed specifically for hypersonic flight at the cruising Mach number 7. After a flight outside the atmosphere, the wave rider will reenter at supersonic speed. The present investigation is concerned with the theoretical determination of the distribution of the pressure coefficient on the wing surface. The calculation procedure involves the solution of a boundary value problem with respect to the axial disturbance velocity. In the considered case, it is necessary to find the solution of a three-dimensional linearized partial differential equation, taking into account the linearized boundary condition on the wing, or the Mach cone (at the apex of the wave rider), and at infinity. A comparison of the theoretically and experimentally determined values for the pressure distribution shows very good agreement for the entire wing surface. G.R.

A82-19198 **The velocity potential for the harmonically oscillating, rectangular wing with semiinfinite span in nonlinear theory (Das Geschwindigkeitspotential für den harmonisch schwingenden, rechteckigen Flügel halbunendlicher Spannweite in der nichtlinearen Theorie).** S. Turbatu (Centrul National de Fizica, Bucharest, Rumania). *(Gesellschaft für angewandte Mathematik und Mechanik, Wissenschaftliche Jahrestagung, Berlin, West Germany, Apr. 8-11, 1980.) Zeitschrift für angewandte Mathematik und Mechanik,* vol. 61, Apr. 1981, p. T 193-T 195. 9 refs. In German.

A nonlinear potential equation employed by Landahl (1961) is considered. The equation is obtained on the basis of small perturbation theory for conditions near the sonic velocity. The present investigation is concerned with flows for which the free stream Mach number is one. The simplified equation corresponding to the selected condition is solved with the aid of an approach reported by Teipel (1964) and Ruo (1974). The solution procedure makes also use of the parabolic method considered by Oswatitsch and Keune (1955). A boundary value problem is obtained, and solved according to a method reported by Burger (1959). A general formula for the calculation of all desired quantities is derived, and the solution of the problem for the wing is obtained. The formula can be transformed into an expression of linear theory by setting a certain parameter equal to zero. The resulting expression agrees with the solution reported by Turbatu (1964, 1979). G.R.

A82-19201 * # **Ground effect hover characteristics of a large-scale twin tilt-nacelle V/STOL model.** M. R. Dudley, M. D. Falarski (NASA, Ames Research Center, Moffett Field, CA), A. Pisano (U.S. Navy, Naval Air Systems Command, Washington, DC), and W. G. Hill (Grumman Aerospace Corp., Bethpage, NY). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2609.* 11 p. 8 refs. Research sponsored by the Grumman Aerospace Corp., U.S. Navy, and NASA.

This paper is a summary of an analysis of the ground-effect characteristics of a large-scale twin-engine, tilt-nacelle V/STOL model. The analysis considers data from the flow field beneath the full-scale model, as well as small-scale model test data, and makes comparisons with jet-ground interactions predicted by a computer code. The data from the large-scale test comprise ground-plane surface temperatures, static pressure distribution and wall-jet total-pressure profiles, fuselage undersurface static pressures, and model forces and moments. The results indicate that the near-field flow is more complex than is indicated by either the small-scale uniform jet studies or the computer predictions. The far field flow characteristics do show some similarity for these three cases. (Author)

A82-19202 * # **Experimental investigation of a jet inclined to a subsonic crossflow.** K. Aoyagi and P. K. Snyder (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2610.* 15 p. 10 refs.

Experimental investigations have been conducted to determine the surface-pressure distribution on a flat plate and a body of revolution with a jet issuing at a large angle to the free stream and to obtain a better understanding of the entrainment mechanism close to the jet exit by quantitative mean velocity surveys. Pressure data were obtained with a flat plate model at several nozzle injection angles using a single round nozzle. For the body of revolution model, data were obtained with a round jet exhausting perpendicular to the crossflow and with two round jets spaced two to six nozzle diameters apart. Mean velocity measurements were obtained with laser velocimeter surveys near the base of a round jet exhausting normal to a flat plate. For the flat plate model, the pressure field shifts downstream and the entrainment effect decreases with decreasing nozzle injection angle. For the body of revolution model with two jets, the jet-induced effect of the rear jet on the surface-pressure distribution was less than the front jet. The flow regions close to the jet are defined by the laser surveys, but further mean velocity surveys are required to understand the entrainment mechanism. (Author)

A82-19203 * # **Thrust-induced effects on low-speed aerodynamics of fighter aircraft.** D. W. Banks, P. F. Quinto, and J. W. Paulson, Jr. (NASA, Langley Research Center, Subsonic Aerodynamics Branch, Hampton, VA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2612.* 10 p. 10 refs.

The design and technology requirements for STOL fighter aircraft as defined in NASA studies are reviewed. The research has concentrated on advanced high-lift systems using mechanical flaps, methods of obtaining longitudinal trim during the use of thrust vectoring, and thrust reversal to shorten ground roll distances. Several early configurations are described, and investigations of the effect of thrust reversal on the low-speed aerodynamics of the F-15 are detailed. Although the NASA design was a wing-canard configuration, similarities in a Grumman baseline STOL aircraft allowed incorporation of the Grumman nacelle, primary nozzles, spanwise blowing nozzles, and trailing-edge flap systems. M.S.K.

A82-19204 # **Tactical STOL moment balance through innovative configuration technology.** G. J. Eckard, R. C. Sutton (Boeing Military Airplane Co., Seattle, WA), and G. E. Poth (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2615.* 15 p.

Innovative and conventional thrust vectoring moment balance mechanisms, as applied to advanced tactical fighters, are examined. The innovative mechanisms include thrust line translation, life line translation, and auxiliary power control; the conventional mechanisms under investigation are horizontal tails, canards, and variable sweep wings. These mechanisms are tested for their ability to provide negative static margins for landing approach or relocation of the vectored thrust line nearer the aircraft's center of gravity. The net pitching moment due to wing, flaps, and vectored thrust lift would then be small, making possible beneficial trim forces from small trimming devices. These innovative mechanisms are, however, possibly heavy and must be evaluated on their complexity, reliability, maintainability, and STOL capabilities. Several candidate fighter configurations are compared and evaluated. J.F.

A82-19205 # **Application of thrust vectoring for STOL.** P. D. Whitten, R. W. Woodrey, and J. E. Hames (General Dynamics Corp., Fort Worth, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2616.* 13 p. 12 refs.

Studies of generic aircraft configurations to determine the payoff of thrust vectoring for direct lift during STOL landings and takeoff and for control power augmentation during weapons-delivery maneuvers are described. Results show that for a nominal 1000-foot landing distance, direct-lift benefits are small, but significant improvements in control power augmentation contribute to payoffs in takeoff distance and recovery from roll-pitch-coupling-induced departures at high angles of attack. (Author)

A82-19206 # **STOL capability impact on advanced tactical aircraft design.** R. E. Krepski (Grumman Aerospace Corp., Bethpage, NY) and R. E. Hudson, Jr. (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2617.* 9 p.

The design and technical issues affecting supersonic STOL development as an airbase attack fighter are discussed. An Air Force study has indicated that, from a weight and cost standpoint, the preferred directions will include two-dimensional nozzles with vectoring and thrust reversing capability. Take-off and landing requirements would determine other design features, and the use of a jump strut to enable landing maneuvers to be made at pitch angles which would normally drag the tail is detailed. The addition of a tip-mounted reaction control system is foreseen as necessary for roll control at the low aerodynamic speeds of STOL landing. A severe 700 ft landing distance design is outlined, and includes a lifting engine with bleed-air features to feed the reaction control system. M.S.K.

A82-19207 * # **Analysis of data from a wind tunnel investigation of a large-scale model of a highly maneuverable supersonic V/STOL fighter - STOL configuration.** M. D. Falarski, M. D. Dudley (NASA, Ames Research Center, Moffett Field, CA), and G. Howell (General Dynamics Corp., Fort Worth, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2620.* 21 p. 13 refs.

The surface pressure and thermal characteristics of a large-scale model of a highly maneuverable supersonic fighter with STOL capability are described. The 7.28 m span model is powered by two J-97 turbojets, operated at 9340 N thrust. It combines upper-surface and spanwise blowing to augment the lift characteristics over a wide flying the airplane so as to zero the horizontal and vertical needles, the pilot flies an approximation to a time-optimal intercept trajectory. The various display and computation modes that are available will be described and results will be presented illustrating the performance of the algorithms with a pilot in the loop. (Author)

A82-20297 * # **Development of a digital integrated automatic landing system /DIALS/ for steep approach and landing.** N. Halyo (Information and Control Systems, Inc., Hampton, VA) and R. M. Hueschen (NASA, Langley Research Center, Hampton, VA). *AIChE, ASME, IEEE, and ISA, Joint Automatic Control Conference, University of Virginia, Charlottesville, VA, June 17-19, 1981, Paper,* 10 p. 12 refs. Contracts No. NAS1-15116; No. NAS1-12754.

This paper describes the development of a three-dimensional digital integrated automatic landing system (DIALS) for a small commercial jet transport. The system uses the Microwave Landing System (MLS), body-mounted accelerometers, as well as on-board sensors usually available on commercial aircraft, but does not require inertial platforms. The system development uses modern digital control techniques. The phases of flight considered are the localizer and glideslope capture, which may be performed simultaneously or sequentially, localizer and glideslope track (hold), crab/decrab, and flare to touchdown. The system captures, tracks and flares from steep glideslopes (2.5 - 5.5 deg) selected prior to glideslope capture. The results of a nonlinear simulation are presented. (Author)

A82-20298 # **Endwall boundary layer flows and losses in an axial turbine stage.** I. H. Hunter (Shell Research, Ltd., Thornton Research Centre, Chester, Ches., England). *(American Society of Mechanical Engineers, International Gas Turbine Conference and Products Show, Houston, TX, Mar. 9-12, 1981.) ASME, Transactions, Journal of Engineering for Power,* vol. 104, Jan. 1982, p. 184-193. 12 refs. Research supported by the Central Electricity Generating Board.

In order to gain an insight into boundary layer phenomena in axial flow turbines, experimental studies were carried out on a large-scale, low speed, single stage machine. Low and high frequency instrumentation supplemented by flow visualizations were used to determine the details of the flows and losses in the stator and rotor blade rows. Measurements of the turbine stator flows, which were obtained at two different inlet wall boundary layer thicknesses, were generally consistent with typical linear cascade observations. A major difference concerned the presence of appreciable radially directed flow. Hot-wire anemometry measurements at the turbine rotor exit, revealed strong secondary flows at the high turning hub section. The flow pattern was seen to be influenced by the spacing between the two rows of blades and by the rotor's instantaneous position with respect to the periodic flow field arising from the upstream stator row. (Author)

A82-20299 # **Boundary layer transition and separation on a compressor rotor airfoil.** R. P. Dring (United Technologies Research Center, East Hartford, CT). *ASME, Transactions, Journal of Engineering for Power,* vol. 104, Jan. 1982, p. 251-253.

Boundary layer calculations based on potential flow comparisons and comparisons with surface flow visualizations are presented for locating the boundary layer transition and separation. The flow at the midspan of a multistage compressor was studied using Ozalid paper on the blades in an ammonia flow with operational conditions. A turbulent boundary layer calculation showed separation close to the trailing edge, while actual observations showed attachment at the trailing edge. The visualization technique using Ozalid paper on compressor rotors is judged to be effective in studying boundary layer transition where centrifugal and Coriolis forces cause boundary layer skewing, and allows two-dimensional boundary layer analysis for predictions of the locations of transition and separation in the design of compressor airfoils. M.S.K.

A82-20407 **Mapping in tropical forests - A new approach using the laser APR.** H. Arp, J. C. Griesbach (TRANARG CA, Caracas, Venezuela), and J. P. Burns. *Photogrammetric Engineering and Remote Sensing,* vol. 48, Jan. 1982, p. 91-100. 7 refs.

Novel techniques involving the Laser Airborne Profile Recorder (Laser APR) have been developed as a solution to the problem of topographic mapping in dense tropical forests. The narrow laser beam used is able not only to record profiles of the tree canopy, but penetrate through small openings to ground level. Tree heights are then determined by comparing recorded profiles. The system is applied to the mapping of the Rio Caura reservoir site in southern Venezuela, where topographic maps showing 5-10 m contours of the 800 sq km area were completed in five months by means of Laser APR flights at 1.5 km intervals. A special, three-channel Autotape, mounted on a helicopter, was used in photogrammetric control location by trilateration from ground stations to the hovering aircraft. Many Laser APR-derived elevations were identified on the existing, 1:50,000-scale photography used for the mapping. O.C.

A82-20447 * # **Structure and variability of the Alboran Sea frontal system.** R. E. Cheney (NASA, Goddard Space Flight Center, Greenbelt, MD) and R. A. Doblar (U.S. Navy, Naval Ocean Research and Development Activity, Bay St. Louis, MS). *Journal of Geophysical Research,* vol. 87, Jan. 20, 1982, p. 585-594. 8 refs. Navy-sponsored research.

A distinct oceanic front coinciding with the jet of incoming North Atlantic water, and an associated anticyclonic gyre in the western half of the basin, were observed during a ship and aircraft survey of the physical characteristics of the Alboran Sea in the western Mediterranean in October 1977. The front was confined to the upper 200 m and was a continuous feature, extending from the Strait of Gibraltar 500 km eastward to the prime meridian. It is noted that in ten days between two surveys, the center of the gyre shifted 50 km westward. This variability of the anticyclonic gyre may correspond to changes of North Atlantic inflow strength, as inferred by local wind and the average atmospheric pressure over the western Mediterranean. O.C.

A82-20506 **Methods and models for predicting fatigue crack growth under random loading.** Edited by J. B. Chang (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA) and C. M. Hudson (NASA, Langley Research Center, Hampton, VA). Philadelphia, PA, American Society for Testing and Materials (ASTM Special Technical Publication, No. 748), 1981. 145 p. $16.50.

Papers are presented in the volume summarizing the baseline data, methodology, procedures, and results of a round-robin analysis which was conducted to predict the fatigue crack growth in 2219-T851 aluminum center-cracked specimens subjected to flight loading in random cycle-by-cycle format. The objective of the analysis was to assess whether data from constant-amplitude fatigue crack growth tests on center-cracked specimens can be used to predict fatigue crack growth lives under random loading. The following approaches are discussed in detail: a root-mean-square approach, a crack-closure model, a multi-parameter yield zone model, and a load-interaction model. V.L.

A82-20509 * **A crack-closure model for predicting fatigue crack growth under aircraft spectrum loading.** J. C. Newman, Jr. (NASA, Langley Research Center, Hampton, VA). In: Methods and models for predicting fatigue crack growth under random loading. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 53-84. 20 refs.

The present paper is concerned with the development and application of an analytical model of cyclic crack growth that includes the effects of crack closure. The model was based on a concept like the Dugdale model, but was modified to leave plastically deformed material in the wake of the advancing crack tip. The model was used to correlate crack growth rates under constant-amplitude loading and to predict crack growth under aircraft spectrum loading on 2219-T851 aluminum alloy plate material. The predicted crack growth lives agreed well with experimental data. The ratio of predicted-to-experimental lives ranged from 0.66 to 1.48. (Author)

A82-20510 * **Multi-parameter yield zone model for predicting spectrum crack growth.** W. S. Johnson (NASA, Langley Research Center, Hampton, VA). In: Methods and models for predicting fatigue crack growth under random loading. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 85-102. 24 refs.

A phenomenological load interaction model referred to as the Multi-Parameter Yield Zone model is presented which accounts for crack growth retardation caused by previous overloads, acceleration due to current overloads, and underload effects. In the present model, load interaction effects are calculated utilizing a residual stress intensity concept. Crack growth retardation and acceleration are accounted for by decreasing or increasing, respectively, the effective stress ratio used in a modified Forman's (1967) crack growth equation. Results of spectrum crack growth predictions for 2219-T851 aluminum are presented. V.L.

A82-20511 **Crack growth behavior of center-cracked panels under random spectrum loading.** J. L. Rudd and R. M. Engle, Jr. (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Methods and models for predicting fatigue crack growth under random loading. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 103-114. 8 refs.

A study was carried out to assess the validity of using constant-amplitude fatigue crack growth rate data for center-cracked panels to predict the crack growth behavior of center-cracked panels subjected to random flight-by-flight spectrum loading. Analytical/experimental correlations and an evaluation of the sensitivity of the correlations to the overload shut-off ratio and threshold maximum stress-intensity factor used in the analyses are presented. It is concluded that the crack growth behavior of center-cracked panels subjected to random flight-by-flight loading can be accurately predicted from center-cracked panel constant-amplitude fatigue crack growth rate data. V.L.

A82-20512 **Random spectrum fatigue crack life predictions with or without considering load interactions.** J. B. Chang, M. Szamossi, and K.-W. Liu (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA). In: Methods and models for predicting fatigue crack growth under random loading. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 115-132. 14 refs. Contract No. F33615-77-C-3121.

Constant-amplitude fatigue crack growth rate data for 2219-T851 aluminum center-cracked tension specimens have been used to predict fatigue crack lives under random spectrum loading with and without considering load interaction. When the load interaction effects are not considered, the predictions are shown to be conservative for those spectra consisting of predominant tensile overload cycles, whereas for spectra consisting of predominant tension-compression cycles, unconservative predictions will result. A range-pair counting procedure that properly counts the cycles in a random spectrum improves crack growth predictions. The crack growth analysis methodology and computation procedures are discussed in detail. V.L.

A82-20513 **Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981.** Symposium sponsored by the Royal Aeronautical Society. London, Royal Aeronautical Society, 1981. 77 p.

Topics discussed include design possibilities for improved fuel efficiency of civil transport aircraft, energy management in military combat aircraft, and the control of aircraft gas turbines for fuel economy. Particular attention is given to the impact of increasing cost upon the design of avionic fuel management systems and the operational and performance aspects of fuel management in civil aircraft. Consideration is also given to the FS2 Bedford Civil Flight Research Program as well as current and future developments in thrust management. J.F.

A82-20514 **Design possibilities for improved fuel efficiency of civil transport aircraft.** D. H. Jagger (Airbus Industrie, Blagnac, Haute-Garonne, France). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 9 p.

The possible application and potential benefits of various technical advances in aerodynamics, structures, and propulsion for the reduction of fuel usage in future Airbus aircraft are discussed. In particular, technical comparisons and tradeoffs in terms of fuel economy are considered for a hypothetical medium-range project aircraft of the 1980's. Improvements in fuel used per passenger at 1,000 n.m. range over two successive periods of 20 years are estimated. A breakdown of the objectives, time-scales, and costs of of a turbine blade, were preheated and cooled by jets from different impingement tubes at various flow rates and distances. The lumped capacity method was used to determine the cooling rate of the aluminum specimen. The mean heat transfer coefficients were calculated and correlated with dimensionless parameters. The results of the Nusselt numbers obtained from experiments were consistent with those calculated from the recommended formula. Furthermore, these results were compared with the correlations of Metzger and those of Ravuni and Tabakoff, and it was concluded that the formula proposed by this paper was more reasonable. (Author)

A82-20515 **Energy management in military combat aircraft.** J. W. Lyons (British Aerospace Public, Ltd., Co., Aircraft Group, Brough, Humberside, England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 6 p. 5 refs.

Energy management is important not only for fuel economy, but for efficient three-dimensional maneuvering capabilities as well. The principles of several new techniques for energy efficient three-dimensional maneuvers in combat aircraft are discussed. Efficient turbofan engines have been adopted which are electronically controlled for achieving precise thrust settings within engine limits. Engine bleed can be better controlled, and hydraulic pressure control, resulting in reduced mechanical offtakes from the engine, is now possible using microprocessors. Self-healing systems can be used in the battlefield scenario, and advanced display concepts are being employed to make better use of available maneuver energy. These techniques individually result in greater efficiency, but together they provide significant synergistic improvements. J.F.

A82-20516 **The control of aircraft gas turbines for fuel economy.** D. J. Lee (Rolls-Royce, Ltd., Bristol, England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 7 p.

Electronic controls are important to the fuel efficient aircraft of the future as sophisticated fly by wire controls, flight management systems, and complex ATC navigation systems. The functions obtainable using electronic controls are often more complex and more flexible than those produced with hydromechanical systems. They provide greater accuracy in staying within temperature and stress limitations, as well as increased fuel economy. Electronic engine control is also very cost effective over the life of the unit and has the benefit of reducing the pilot workload. Microprocessors have made the use of digital technology for engine control more popular; the benefits of digital control may be seen in terms of improved accuracy, fault diagnostics and tolerance, fuel-type variations, system complexity, and airframe integration. Finally, engine health monitoring systems are used for the programmed maintenance of mechanical parts of gas turbines. J.F.

A82-20517 **The impact of increasing energy costs upon the design philosophy of avionic fuel management systems.** P. R. Thrift (Smiths Industries Aerospace and Defence Systems Co., London, England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 9 p.

Parameters of fuel quantity remaining and rate-of-usage are determinate factors in the operational range of any aircraft. Methods for designing engines with lower fuel consumption, and airframes with lower drag coefficients to minimize the mass of fuel to be carried are being investigated. Operating costs may be reduced by using unused portions of fuel as dynamic balast to control the center of gravity throughout a flight profile. Fuel consumption can also be reduced by control of the aircraft's complete flight envelope. Strategies for measuring fuel mass and determining fuel density are discussed. Means of improving the twin concentric circular cross section transducers are discussed, and the production of a fault tolerant system by the incorporation of two computer systems is described. Finally, the use of microprocessors to control the center of gravity and to detect fuel leaks is discussed. J.F.

A82-20518 **Operational and performance aspects of fuel management in civil aircraft.** H. P. K. Dibley (British Airways, Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 11-16.

The Global Positioning System Evaluator (GPSE) is a test facility for GPSE user equipment which presents the user with the RF signals, inertial measurement, and barometric altimeter data it would sense in a wide range of environments. Testing in the GPSE environment exhibits several advantages over flight testing. In addition to the obvious cost benefits and repeatability of simulator testing, the GPSE can simulate a wide range of dynamics (up to 2100 m/s velocity, 30 g acceleration) and simulates a full 24-satellite configuration (a satellite-selection algorithm is used to choose optimum satellite geometries), allowing real-time segments of up to 10 hours duration. This paper describes GPSE model implementation and presents the system performance characteristics. B.J.

A82-21589 # **A perspective on civil use of GPS.** W. C. Euler (Magnavox Advanced Products and Systems Co., Torrance, CA). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 33-39. 19 refs.

It is noted that, while the GPS development program has made remarkable progress, the case for civilian users has advanced only marginally. The absence of a concrete policy regarding access, accuracy, and user charges has resulted in conservatism on the part of the affected government agencies as well as industry. It is suggested that the development of a firm national policy for the civil use of Navstar is essential to optimize the planning and equipment evolution to be carried out by affected government agencies, civil users, and equipment manufacturers. B.J.

A82-21590 # **The application of strapdown inertial technology to Attitude and Heading Reference System requirements.** G. W. Gilster (Litton Industries, Guidance and Control Systems Div., Woodland Hills, CA). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 48-56.

The LR-80 AHRS (Attitude and Heading Reference System) for the YAH-64 advanced attack helicopter is described. The LR-80 offers a unique AHRS solution in that it employs a strapdown inertial navigation mechanization and provides 'dynamically exact' measurement of vehicle maneuvers. A competitive system cost is achieved by the use of automatic self-calibration techniques, Doppler damping, and application of the inherent virtues of a strapdown mechanization which minimizes electromechanical complexity. The system configuration and design features are described, and flight test results for representative helicopter mission conditions are presented, showing the combined Doppler/AHRS navigation results obtained. Also considered are other potential applications for the system, including missiles and other aircraft, and the flexibility for integration with other navigation aids. B.J.

A82-21591 # **The emerging need for improved helicopter navigation.** N. T. Fujisaki (FAA, Washington, DC). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 57-64. 6 refs.

The paper reviews significant helicopter trends and the new complexion of resultant navigation requirements. Programs aimed at immediate problems are considered along with long-term plans to improve helicopter navigation. The essential elements of the FAA helicopter R&D effort are described, and potential areas for future work are also considered (including integrated cockpit system development). B.J.

A82-21592 # **Helicopters and Navstar/GPS.** G. A. Gilbert (Glen A. Gilbert and Associates, Inc., Washington, DC). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 65-70.

The elements of an ideal helicopter navigation system are described and evaluated in relation to GPS. Proposed system architecture is presented and principal elements are discussed; and a concept validation program is outlined. This program could lead into an advanced (fourth generation) air traffic control system which would serve not only helicopters but all civil aviation together with military aircraft in the common NAS. Transition to this system would begin in the mid 1980's, with full operational capability in place by the mid 1990's. B.J.

A82-21593 # **Systems approach to the design of wind shear avionics.** N. J. Cafarelli (Automation Industries, Inc., Wheaton, MD) and J. P. McVicker (FAA, Systems Research and Development Service, Washington, DC). In: Institute of Navigation, Annual Meeting, 36th, Monterey, CA, June 23-26, 1980, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 99-103.

The FAA Wind Shear Program Office has completed an analytical investigation of the wind shear phenomenon, with emphasis on threat definition and the detection and avoidance of atmospheric anomalies. This paper summarizes some of these activities and suggests relevant information categories that should be considered in the design of a wind shear avionics system. These categories are: (1) predictive information, which defines specific characteristics and magnitude of an atmospheric anomaly prior to penetration; (2) anticipatory information, which establishes the existence of an atmospheric anomaly prior to penetration, but does not define its characteristics; and (3) reactive information, which defines the characteristics and magnitude of an atmospheric anomaly during penetration. The advantages and limitations of each information category are considered, along with some representative implementations. B.J.

A82-21597 **The case for helicopter hoisting.** W. J. Maddox, Jr. (Arabian Helicopters, Ltd., Dhahran, Saudi Arabia). *Vertiflite,* vol. 28, Jan.-Feb. 1982, p. 16-19.

Helicopter crew training and operations for hoisting personnel while hovering over offshore oilfields and over tankers, and for personnel transport to and from work in the Persian Gulf area are described. Personnel hoisting by commercial helicopters is noted to be illegal in the U.S., while oil company helicopter crews receive training for such operations in Louisiana. A 15-ft clear zone is needed for off-the-deck hoisting when landing cannot be achieved, and most work done in the Near East zone comprises delivery of harbor pilots to their craft. The pilot nominally approaches from the upwind side of a ship or platform to provide a safety margin in case of a power-out condition, and flights are limited to two passengers. Improvements are suggested for better ship identification lights and better lighted landing and hoist areas. M.S.K.

A82-21629 † **Studies on the stability of thin-walled shells with cutouts /Review/. I (Ob issledovaniiakh ustoichivosti tonkostennykh obolochek s vyrezami /Obzor/. I).** I. N. Preobrazhenskii. *Problemy Prochnosti,* Jan. 1982, p. 21-32. 50 refs. In Russian.

A82-21636 † **Dispersion and temperature-force dependence of the high-temperature strength characteristics of a gas-turbine-engine disk alloy (Dispersiia i temperaturno-silovaia zavisimost' kharakteristik zharoprochnosti splava dlia diskov GTD).** E. P. Golubovskii, I. P. Bulygin, and F. V. Iushakova. *Problemy Prochnosti,* Jan. 1982, p. 68-73. In Russian.

Experimental data are presented on the time-to-failure dispersion (under uniaxial tension and under stress concentration), long-term plasticity, and time of accumulation of a specified amount of creep strain (0.2 and 0.5%) for disk alloy EP109VD. It is shown that the dispersion of high-temperature strength characteristics changes in accordance with the vibration decay law as the time to failure increases. Empirical equations are derived which can be used to calculate the bounds of long-term strength, long-term plasticity, and creep for given fracture probabilities. V.L.

A82-21848 **Very high speed integrated circuits: Into the second generation. II - Entering Phase 1.** J. Martin (National Semiconductor Corp., Santa Clara, CA). *Military Electronics/Countermeasures,* vol. 8, Jan. 1982, p. 60-63, 65, 66.

The intended applications of the Very High Speed Integrated Circuits (VHSIC) chips and technologies fall into four basic categories. These categories are related to current operational systems which could be improved through VHSIC technologies without change in performance, the addition of new performance features to existing systems, planned upgrades of existing systems through the use of VHSIC technologies, and new systems which could not be developed without the use of VHSIC technology. Attention is given to system design evolution, aspects of technology insertion, advantages related to standardization, applications related to the development of the next generation Advance Tactical Fighter aircraft, the improvement of reliability, and technology transfer issues. G.R.

A82-21897 **Process monitor helps make jet engines reliable.** *Materials Evaluation*, vol. 40, Feb. 1982, p. 159, 160.

A microprocessor-controlled general-purpose process monitor has been developed for automatic testing of jet engine components, in particular wheels or disks of compressors and turbines from 10 to 30 inches in diameter, at speeds up to 60,000 rpm. Load-cycle fatigue-life tests are performed in six spin pits and are automatically controlled within a range defined by low-speed and high-speed setpoints set by the operator. A complete cycle, from low speed to high speed and back to low, may be completed in less than a minute for a small part and in up to 5 min for a large one. V.L.

A82-21900 **Low-frequency eddy current inspection of aircraft structure.** D. J. Hagemaier and A. P. Steinberg (Douglas Aircraft Co., Long Beach, CA). *Materials Evaluation*, vol. 40, Feb. 1982, p. 206-210. 5 refs.

Low-frequency eddy-current inspection is used to detect fatigue cracks emanating from fastener holes in a wing spar cap and shear-lip in thin multiple-layered structures. It is shown that the technique is useful for detecting subsurface cracks in aluminum structures up to 8.9 mm thick at 100 Hz. The low-frequency eddy current method is also shown to be capable of detecting cracks that are not detectable by X-ray radiography, in particular, shear-lip cracks oriented at 45 deg to the X-ray beam. V.L.

A82-21941 # **Analytical control law for desirable aircraft lateral handling qualities.** H. Ohta (Nagoya University, Nagoya, Japan), P. N. Nikiforuk, and M. M. Gupta (Saskatchewan, University, Saskatoon, Canada). *Journal of Guidance, Control and Dynamics*, vol. 5, Jan.-Feb. 1982, p. 79-85. 8 refs. Natural Sciences and Engineering Research Council of Canada Grants No. A-5625; No. A-1080.

A model-matching technique is used to synthesize a control law which augments the lateral dynamics of an aircraft. The feedback and feedforward gains are derived in terms of the lateral stability derivatives and the control law is designed to satisfy specified lateral handling criteria. The augmented plant has specified lateral characteristic poles and a decoupled transfer function matrix between the aileron and rudder angles as inputs and the bank and sideslip angles as outputs. Approximate relationships are derived between the basic and augmented stability derivatives and presented in tabular form. The feedback gains are determined using the augmented derivatives. Simulation examples for three different flight conditions of a STOL aircraft are given to illustrate and substantiate the effectiveness of the control law. (Author)

A82-22027 # **FAA/NWS aviation route forecast /ARF/ development.** T. R. Mitchell (Mitre Corp., McLean, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0013*. 10 p. 15 refs.

It has been recommended that greater emphasis be placed on the mass dissemination of aviation weather data, because a study of such data is important in planning a safe, expeditious flight. An approach which can provide such a mass dissemination of weather data on a cost-effective basis is considered. According to this approach, pilots could partially 'brief themselves' by directly accessing a computer data base of geographically-retrievable weather messages. Access would be by Direct User Access Terminals (DUAT's) or, alternatively, by using Touchtone telephone tones for providing input to the system and a Voice Response System (VRS) for output. To demonstrate the concepts and resolve the uncertainties, a prototype development program was undertaken. A real-time textual aviation weather data base and DUAT retrieval capabilities were developed on a network of minicomputers. Attention is given to the need for aviation route forecasts (ARF) and aspects of ARF development. G.R.

A82-22028 # **A perspective of computational aerodynamics from the viewpoint of airplane design applications.** L. R. Miranda (Lockheed-California Co., Computational Aerodynamics Dept., Burbank, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0018*. 18 p. 56 refs.

A survey of the use of computational aerodynamics as a tool for airplane design is presented. Some general characteristics and requirements of the airplane design process are discussed and particular attention is given to those computer code characteristics that will enhance the effectiveness of computational aerodynamics. The various elements that are needed in a computer code in order to numerically simulate flows for practical applications are identified. The nature of each one of these elements and how it is impacted by considerations of effectiveness are discussed. The most commonly used approaches are reviewed and to what degree they are able to meet the needs of the airplane designer is pointed out. Problem areas are highlighted; present efforts to solve these problems are examined and, in some cases, alternative approaches are indicated. (Author)

A82-22045 * # **Recent advances in applying Free Vortex Sheet theory to the estimation of vortex flow aerodynamics.** J. M. Luckring, W. E. Schoonover, Jr., and N. T. Frink (NASA, Langley Research Center, Transonic Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0095*. 18 p. 33 refs.

Free Vortex Sheet theory has been applied to a variety of configurations for the estimation of three-dimensional pressure distributions for wings developing separation-induced leading-edge vortex flows. Correlations with experiment show reasonable estimates for the effects of compressibility, side-slip, side edges, swept-wing blast-induced loads, and leading-edge vortex flaps. Theoretical studies expand upon these correlations to show general aerodynamic trends. Consideration is also given to simple, yet effective techniques which expedite convergence and therefore reduce computational expense. (Author)

A82-22046 # **Wing-canard aerodynamics at transonic speeds - Fundamental considerations on minimum drag spanloads.** W. H. Mason (Grumman Aerospace Corp., Bethpage, NY). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0097*. 10 p. 30 refs. Research supported by the Grumman Aerospace Corp.

Current methods for drag minimization minimize only the induced drag portion of the total drag. For many advanced supersonic aircraft, these methods are not valid when considering the transonic maneuver case. This paper describes an approximate method which extends the drag minimization schemes to include transonic wave drag and viscous drag, and then demonstrates the importance of these contributions when performing aerodynamic design at transonic maneuvering conditions. Typical results show both a reduction in total drag and a shift in the minimum drag center of gravity when these additional drag sources are included in the analysis. Another important consideration in canard-wing design is the canard wake modeling choice. In the second section of the paper, the results of two model problems provide a quantitative measure of the potential errors arising from various wake models. (Author)

A82-22052 * # **Alleviation of the subsonic pitch-up of delta wings.** D. M. Rao (Vigyan Research Associates, Inc., Hampton, VA) and T. D. Johnson, Jr. (Kentron Technical Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0129*. 10 p. 7 refs. NASA-supported research.

A 'pylon vortex generator' concept has been proposed for alleviating the subsonic pitch-up instability of highly swept supersonic-cruise wings. Fixed at a part-span location, this leading-edge device utilizes the lateral velocity component in the flow approaching the swept leading edge to generate a streamwise vortex, Distributed processing and its application to avionic systems are discussed.

N82-17087# Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
DISTRIBUTED DATA PROCESSING: WHAT IS IT?
Philip H. Enslow, Jr. *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 10 p refs

(Contract N00014-79-C-0873)
Avail: NTIS HC A18/MF A01

Distributed processing is presented as the means to obtain improvements in a number of areas of system performance. Utilizing a list of these desired improvements as the motivational factors, the key design characteristics of systems that delivers a major proportion of these improvements are presented. J.D.H.

N82-17088# Ferranti Ltd., Bracknell (England). Computer Systems Div.
THE EFFECT OF INCREASINGLY MORE COMPLEX AIRCRAFT AND AVIONICS ON THE METHOD OF SYSTEM DESIGN
J. T. Martin *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 5 p

Avail: NTIS HC A18/MF A01

The evolution of aircraft and their associated avionics is described. The evolutionary progress is considered as starting from a simple low speed aircraft with rudimentary flight instruments and sighting systems, through the interconnection of some of these systems and progressing to recent avionic systems with centralized digital computing. It is shown how the changes in aircraft systems, from the simple analog connection of a few systems, through the analog sensor/interface box/centralized digital system, to the sensor producing digital outputs/interface box/centralized digital system, have produced comparatively small changes in the methodology used for the design of these systems. The move to systems containing distributed processing interconnected by digital highways is shown to be revolutionary rather than evolutionary and to require a new approach to the system design problem so as to reap the maximum advantage from the available computing capability. Author

N82-17089# Naval Air Systems Command, Washington, D. C. Control and Guidance Research and Technology Group.
A TUTORIAL ON DISTRIBUTED PROCESSING IN AIRCRAFT/AVIONICS APPLICATIONS
Bernard A. Zempolich *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 11 p

Avail: NTIS HC A18/MF A01

An overview of the state of the art in real time distributed processing as applied to aircraft/avionics is presented. Definitions and concepts are presented starting with the total aircraft as a real time distributed computer-controlled system. The relationship of aircraft mission and avionic system architectures is discussed. Overall system architectural considerations are identified and their impact upon a real time distributed computer-controlled system is detailed. A top-down hierarchical, architectural structure is presented. This top-down structuring is described in terms of the logical functional decomposition of the system as follows: total aircraft/avionic system partitioning of aircraft/avionic subsystems, interconnect bus structure (network), system-wide processing architecture, subsystems definition, and computer systems. Author

N82-17092# Elektronik-System G.m.b.H., Munich (West Germany)
FUNCTIONAL VERSUS COMMUNICATION STRUCTURES IN MODERN AVIONIC SYSTEMS
K. Brammer and A. Weimann *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 11 p refs

Avail: NTIS HC A18/MF 01

The implications of the increase in functional and communication interfaces on avionic system structures are analyzed. Especially the passage from functional design to implemented communication structure of the airborne electronic system is scrutinized. The distributed organization of an avionic system, the realization of which is greatly simplified by bus type intrasystem signal transmission, is compared to the conventional hierarchical system organization. Advantages and drawbacks of both organizations are reviewed especially with respect to interface efficiency, cabling requirements, and the typical topology of avionic systems. J.D.H.

N82-17097# Naval Air Systems Command, Washington, D. C. Control and Guidance Research and Technology Group.
ECONOMIC CONSIDERATIONS FOR REAL-TIME NAVAL AIRCRAFT/AVIONICS DISTRIBUTED COMPUTER CONTROL SYSTEMS
Bernard A. Zempolich *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 10 p

Avail: NTIS HC A18/MF A01

Economic considerations for Distributed Computer Control Systems (DCCS) are discussed. Centralized, distributed and federated processing architectures are used as the primary set of systems alternatives from which economic factors are developed. The economic impact of subsequent logistic support for standardized computer hardware and software versus non-standard products is identified. System considerations such as reliability, maintainability, availability, built-in-test, fault tolerance, and redundancy are examined from the standpoint of resources available to design and develop the DCCS, and also from the viewpoint of economic impact of failure of the DCCS to perform as expected. The economic impact of external factors such as the rate of technology advancement, technology independence, limited production runs, and the general lack of economic leverage upon the market are examined and related to the life-cycle support requirements of the DCCS. Author

N82-17104# Boeing Military Airplane Development, Seattle, Wash. Digital Flight Controls Research Dept.
STAGE-STATE RELIABILITY ANALYSIS TECHNIQUE
Alan D. Stern *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 7 p refs

Avail: NTIS HC A18/MF A01

An advanced flight control system reliability analysis technique must properly account for the defined success criteria, redundancy level, redundancy management, technique, system dependencies, and failure detection coverage. The stage state reliability analysis technique properly accounts for these factors. It is also computationally simple such that triplex redundant systems have been analyzed using an early 1970's desktop computer. This method is well suited for analysis by the system architect. The process begins with a system block diagram showing all element connections. A success logic diagram is then written reflecting all possible success states. The probability of success equation is written directly from the logic diagram and evaluated by substituting the probability expression for each system element. Multiple success criteria can be applied to one problem formulation simply by deleting those states which do not satisfy the success criterion. Author

N82-17106*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METHODOLOGY FOR MEASUREMENT OF FAULT LATENCY IN A DIGITAL AVIONIC MINIPROCESSOR
John C. McGough, Fred Swern, and Salvatore J. Bavuso *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 18 p refs Prepared in cooperation with Bendix Corp., Teterboro, N.J.

(Contract NAS1-15946)
Avail: NTIS HC A18/MF A01 CSCL 01D

Using a gate level emulation of a typical avionics miniprocessor, fault injection experiments were performed to (1) determine the time to detect a fault by comparison monitoring, (2) forecast a program's ability to detect faults and (3) validate the fault detection coverage of a typical self test program. To estimate time to detect, six programs ranging in complexity from 6 to 147 instructions, were emulated. Each program was executed repetitively in the presence of a single stuck at fault at a gate node or device pin. Detection was assumed to occur whenever the computed outputs differed from the corresponding outputs of the same program executed in a nonfaulted processor. Histograms of faults detected versus number of repetitions to detection were tabulated. Using a simple model of fault detection, which was based in an analog with the selection of balls in an urn, distributions of time to detect were computed and compared

with those obtained empirically. A self test program of 2,000 executable instructions was designed expressly for the study. The only requirement imposed on the design was that it should achieve 95% coverage. The program was executed in the presence of a single stuck-at fault at a gate node on device pin. The proportion of detected faults are tabulated. In all experiments faults were selected at random over gate nodes or device pins.
Author

N82-17106*# SRI International Corp., Menlo Park, Calif. Computer Science Lab.

HIERARCHICAL SPECIFICATION OF THE SIFT FAULT TOLERANT FLIGHT CONTROL SYSTEM

P. M. Melliar-Smith and Richard L. Schwartz *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 15 p refs
(Contract NAS1-15428)
Avail: NTIS HC A18/MF A01 CSCL 01B

The specification and mechanical verification of the Software Implemented Fault Tolerance (SIFT) flight control system is described. The methodology employed in the verification effort is discussed, and a description of the hierarchical models of the SIFT system is given. To meet the objective of NASA for the reliability of safety critical flight control systems, the SIFT computer must achieve a reliability well beyond the levels at which reliability can be actually measured. The methodology employed to demonstrate rigorously that the SIFT computer meets as reliability requirements is described. The hierarchy of design specifications from very abstract descriptions of system function down to the actual implementation is explained. The most abstract design specifications can be used to verify that the system functions correctly and with the desired reliability since almost all details of the realization were abstracted out. A succession of lower level models refine these specifications to the level of the actual implementation, and can be used to demonstrate that the implementation has the properties claimed of the abstract design specifications.
Author

N82-17107# Litton Technische Werke, Freiburg (West Germany).

RECONFIGURATION: A METHOD TO IMPROVE SYSTEMS REALIABILITY

J. Szlachta *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 8 p

Avail: NTIS HC A18/MF A01

A system with hardware and software reconfiguration capabilities was developed to improve the reliability of a flight-augmentation computer. The system consists of a network of n redundant computers, linked via m serial buses. A two computer processing units and two or more input/output drivers. A fault in one of the components of the redundant computers causes a hardware reconfiguration which replaces the faulty component by its still functioning twin. If a redundant computer fails altogether, all tasks allocated to it are transferred to one of the still working computers of the network. This is made possible by loading dormant copies of the tasks into at least one other computer of the initial system. These dormant copies are periodically supplied with the program status of the active copy.
Author

N82-17108# Societe d'Applications Generales d'Electricite et de Mecanique, Paris (France).

A RECONFIGURABLE CHANGE NETWORK FOR DISTRIBUTED PROCESS CONTROL [RESEAU D'ECHANGE RECONFIGURABLE POUR CONTROLE DE PROCESSUS REPARTI]

Ch. Meraud and B. Maurel (Societe. Anonyme de Telecommunications) *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 10 p refs In FRENCH

Avail: NTIS HC A18/MF A01

A highly reliable, high output system of change is described which permits decentralized exchange between the diverse equipment onboard an aircraft or other type of vehicle in order to integrate and reconfigure the functions, no matter how critical. Very large scale integration and fiber optics which are insensitive to electromagnetic perturbations made possible a performing decentralized solution by incorporating intelligence in a universal type linking module called the subsystem interface. For the traditionally programmed mechanism for generating change, a dynamic mechanism immediately adapted to modification, is substituted which permits a great degree of synchronization.
Transl. by A.R.H.

N82-17114# Hughes Aircraft Co., Fullerton, Calif.

NEXT GENERATION MILITARY AIRCRAFT WILL REQUIRE HIERARCHICAL/MULTILEVEL INFORMATION TRANSFER SYSTEMS

James W. McCuen *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 8 p refs

Avail: NTIS HC A18/MF A01

Changes in avionic subsystems and mission roles of next generation aircraft require new concepts in data transfer. New aircraft need total airframe/weapon system integration which means new approaches must be developed for the interconnection of avionic subsystems. Effort has begun to develop a Military Standard (MIL-STD) which will define the requirements for a high speed data bus network. The standard shall characterize a higher order information transfer system (ITS) that will interconnect avionic systems, that contain their own multiplex ITS, into a fully integrated data complex. The higher order ITS shall employ an operational protocol that will provide subsystems and common sensors, independence and fault isolation by distributed control of the common data bus.
Author

N82-17115# Bendix Corp., Teterboro, N. J. Flight Systems Div.

SIFT: AN ULTRA-RELIABLE AVIONIC COMPUTING SYSTEM

Kurt Moses *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 10 p

Avail: NTIS HC A18/MF A01

Software implemented fault tolerance (SIFT) is an ultra-reliable computing system which is based on a multiprocessor architecture that achieves fault tolerance by replicating computing tasks among processing units. Error detection and system configuration are performed by software to maintain the operational integrity of the computing system. The high speed inter-computer communication system required for operation realized by dedicated serial links arrayed in a star connection. Software algorithms are used for failure detection by means of voting, failure isolation to the faulty processor, and reconfiguration after fault detection. Frame synchronization between processors is employed to reduce data skew and minimize false alarms. The architecture of SIFT, its hardware implementation, and the test stand used for evaluation. Potential applications of this technique to current and anticipated ultra-reliable electrical flight control systems are given.
A.R.H.

N82-17117# Royal Aircraft Establishment, Farnborough (England).

INTEGRATED CONTROL OF MECHANICAL SYSTEM FOR FUTURE COMBAT AIRCRAFT

G. W. Wilcock, P. A. Lancaster, and C. Moxey *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 16 p refs Prepared in cooperation with British Aerospace, Warton Sponsored in part by Procurement Executive MOD

Avail: NTIS HC A18/MF A01

Various techniques for the application of digital control to aircraft utility systems were investigated. It is shown that the prefered approach utilizes a number of distributed processors and terminals that interface with the utility components. Analysis performed to data shows a weight saving of approximately 100 Kg (i.e., 50%), and a pilot workload reduction of the order of 4:1, may be achieved in a twin engine combat aircraft.A.R.H.

N82-17119# McDonnell Aircraft Co., St. Louis, Mo.

F/A-18A TACTICAL AIRBORNE COMPUTATIONAL SUBSYSTEM

T. V. McTigue *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 14 p refs

Avail: NTIS HC A18/MF A01

The F/A-18A Hornet tactical computer subsystem consists of two central mission computers and a number of distributed processors embedded in various sensor and display subsystems. This distributed processing system is interconnected by and communicates over a MIL-STD-1553A serial 1 MHz command/response multiplex network. The distributed processing system architecture is discussed and the rationale is presented for the partitioning of the computational tasks between the central mission computers and the distributed processors embedded in the sensor subsystems. The salient features of the central mission computer and the distributed processors are discussed along with a

N82-17232

INSTRUMENT APPROACH CONCEPTS
L. C. Newman, T. N. Shimi, and W. J. Swedish Sep. 1981
85 p refs
(Contract DOT-FA01-81-C-10001)
(AD-A107812; MTR-81W234; FAA-EM-82-3) Avail: NTIS
HC A05/MF A01 CSCL 01/5

Several new concepts for multiple instrument approaches have been proposed to improve capacity and reduce delays at U.S. airports. The concepts include: dependent parallel approaches at reduced runway spacing; independent parallel approaches at reduced runway spacing; converging approaches; and triple approaches. One of the runways involved may be a separate short runway for general aviation and commuter traffic. A survey of 101 top U.S. airports was performed to determine the potential for applying the concepts to the existing runways. Specific applications of each relevant concept are provided. Calculations were performed for the top 30 U.S. air carrier airports to determine the actual delay improvement which could be expected to result from application of the multiple-approach concepts. Additionally, some general results are obtained for the remaining 71 airports.
Author (GRA)

N82-17232# European Space Agency, Paris (France).
A SIMPLE HYBRID VISUAL SIMULATION FOR RESEARCH FLIGHT SIMULATORS
Friedrich Erdmann and Eckhard Biertuempel Nov. 1981 46 p refs Transl. into ENGLISH of "Eine einfache hybride Sichtsimulation fuer Forschungsflugsimulatoren" Rept. DFVLR-Mitt-80-13 Brunswick, Jul. 1980
(ESA-TT-690; DFVLR-Mitt-80-13) Avail: NTIS
HC A03/MF A01; DFVLR, Cologne DM 14.40

The basic theory of the system is described together with its realization with general purpose computers (digital-analog). The images generated consist of contour lines of the object. A contour line brightness control (depth screwing) is employed to produce a stereoscopic effect. The applicability of the method is demonstrated using runway, target and horizon symbols and combinations of these symbols. Different scenarios can be simulated in this way.
Author (ESA)

N82-17338# Rockwell International Corp., Thousand Oaks, Calif. Science Center.
SUPERPLASTIC ALUMINUM EVALUATION Final Report, 16 Apr. 1979 - 31 Dec. 1980
M. W. Mahoney and C. W. Hamilton Wright-Patterson AFB, Ohio AFWAL Jun. 1981 203 p refs Sponsored in part by Delaware Univ.
(Contract F33615-79-C-3218; AF Proj. 2401)
(AD-A107760; SC5214.34FR; AFWAL-TR-81-3051) Avail: NTIS HC A10/MF A01 CSCL 11/6

With the development of a process to produce fine grain aluminum alloys, it is now possible to superplastically form (SPF) structural aircraft components. This document presents results from several important areas which are considered to be critical to providing a realistic assessment of the technical and economic potential for superplastic forming structures using a high strength 7475 aluminum alloy. Areas of study included (1) the evaluation of structural applications, (2) the determination of superplastic forming limits, (3) a microstructural study of cavities formed during superplastic deformation, (4) the application of hydrostatic gas pressures to suppress cavitation, and (5) the effect of superplastic deformation on subsequent service properties.
Author (GRA)

N82-17342# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
CORROSION FATIGUE
Oct. 1981 92 p refs Presented at the 52nd Meeting of the AGARD Struct. and Mater. Panel, Cesme, Turkey, 5-10 Apr. 1981
(AGARD-CP-316; ISBN-92-835-1402-5) Avail: NTIS HC A05/MF A01

The objectives, scope, and technical requirements of a cooperative program for corrosion fatigue testing and prevention/aircraft environment simulation fatigue testing are presented. An overview of current and supplemental programs designed to assess current protection systems for aircraft structures is also given.

N82-17343# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Materials Engineering.
MECHANISMS OF CORROSION FATIGUE
D. J. Duquette *In* AGARD Corrosion Fatigue Oct. 1981 12 p refs Sponsored in part by Office of Naval Research

Avail: NTIS HC A05/MF A01

An overview of experimental variables which are considered critical to understanding the mechanisms of corrosion fatigue of high strength aluminum alloys is presented. Based on this overview, an examination of previously proposed mechanisms is attempted. These models include anodic dissolution, surface energy reduction, and hydrogen embrittlement. It is concluded that hydrogen embrittlement of process zones at alloy surfaces (for crack initiation) and at crack tips (for crack propagation) best explains observed results. A general model of corrosion fatigue of these alloys is proposed. This model suggests that the nature of the naturally formed oxide film on aluminum alloys may be a critical factor. Chemical or mechanical damage of the film allows hydrogen ingress. The presence of second phase particles which may act as sinks for dislocation transported hydrogen, may also be a necessary prerequisite to significant amounts of reduction in fatigue resistance associated with corrosion.
Author

N82-17344# Toronto Univ. (Ontario). Dept. of Mechanical Engineering.
FRACTURE MECHANICS BASED MODELLING OF THE CORROSION FATIGUE PROCESS
David W. Hoeppner, Douglas Mann, and J. Weeks *In* AGARD Corrosion Fatigue Oct. 1982 17 p refs Sponsored in part by NSERC and Dept. of Energy, Mines and Resources of Canada

Avail: NTIS HC A05/MF A01

Corrosion fatigue of structural elements involves a synergism between cyclic load and a chemical environment involving both time and temperature as rate-controlling parameters. The development of rational life prediction methods is hampered by both the lack of mechanistic understanding, the large number of corrosion-fatigue synergisms, and the inadequacies of fracture mechanics based models in both pre mode I fatigue cracking and initial mode I cracking. Aspects of mechanisms related to the formulation of corrosion fatigue life prediction models are discussed in relation to micromechanical modelling based on fracture mechanics. Emphasis was placed on the formation of mode I fatigue cracks from pits, and fretting surface damage. A discussion of the needs in this area is presented. It is believed that with further analytical and experimental information the models presented can be verified and provide useful guidance to engineers and scientists attempting to deal with corrosion and fretting fatigue.
Author

N82-17345# Societe Nationale Industrielle Aerospatiale, Suresnes (France). Central Lab.
CORROSION FATIGUE BEHAVIOUR OF SOME ALUMINIUM ALLOYS
D. Aliaga and E. Budillon *In* AGARD Corrosion Fatigue Oct. 1981 12 p
Avail: NTIS HC A05/MF A01

An evaluation of corrosion fatigue strength of aluminum alloys currently used in the aeronautical industry was made. Crack propagation was evaluated in various different environments (dry argon, wet air, salt water). The effect of frequency, of test specimen thickness, and of ratio R (R = Kmin/Kmax) were investigated. And the effect of these various environments on the endurance limit of 10 to the 7th power cycles was likewise studied and some surface protections evaluated. The intent of the survey was to compare the response in fatigue of various aluminum alloys used in the aeronautical construction. The environments studied were the following: dry argon, wet air and salt-water. They were retained so as to simulate and amplify the more or less aggressive nature of these environments in which aircraft can find themselves both on the ground or in the air. The two major aspects of corrosion fatigue namely crack initiation and crack propagation were studied with an emphasis on in-service behaviour. As far as crack initiation is concerned some surface treatments and protections currently used in aeronautics were examined in various environmental conditions.
M.D.K.

N82-17348# Industrieanlagen-Betriebsgesellschaft m.b.H., Ottobrunn (West Germany).
FLIGHT-BY-FLIGHT CORROSION FATIGUE TESTS
Walter Schuetz *In* AGARD Corrosion Fatigue Oct. 1981 10 p refs
Avail: NTIS HC A05/MF A01

Corrosion fatigue tests should be conducted under realistic load sequences especially for tests with riveted specimens because the rare high loads of the spectrum may loosen the fasteners, damaging the corrosion protection system and therefore rendering it ineffective. Possibly this does not happen in constant amplitude tests because the loads may not be high enough to crack the protection system. This was the reasoning behind the test program carried out with flight-by-flight tests. Tests were carried out with two aluminum alloys typical for use in modern and in faying aircraft respectively, namely 7475-T 761 and 7075-T6. The sheet materials were exchanged between two laboratories so that both would use materials of the same heats. The specimens used differed, however, in the corrosion protection systems and in the manufacturing of the specimens by different firms. A project status report is made. M.D.K.

N82-17349# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
AIRCRAFT CORROSION
Aug. 1981 194 p refs Partly in ENGLISH, partly in FRENCH
Meeting held in Cesme, Turkey, 5-10 Apr. 1981
(AGARD-CP-315; ISBN-92-835-0298-1) Avail: NTIS HC A09/MF A01

Corrosion resistant materials and protection systems for aircraft are addressed. The incidence of corrosion of aircraft structures under varying environmental conditions is discussed. Maintenance, cost factors, education and retraining, and the communication link among the designers, manufacturers and the research community are among the topics covered.

N82-17350# Atlantic Fleet, Norfolk, Va.
US NAVAL FLEET AIRCRAFT CORROSION
G. T. Browne *In* AGARD Aircraft Corrosion Aug. 1981 15 p

Avail: NTIS HC A09/MF A01

Water entry and its associated corrosion problems were minimized. A method for sealing environmental connectors without degrading wire quick disconnect capability was incorporated by sealing the back connector shell rubber grommet with clear room temperature vulcanizing silicone type sealant. The screw holes and equipment lids were also sealed in a similar manner. Drain holes were located and drilled in nonstructural areas at low points to remove trapped water and eliminate the corrosive agents. Hidden corrosion was detected by nondestructive inspection methods during rework. These include ultrasonic, X-ray and eddy current inspection and neutron radiography on double skin areas and on areas behind stringers, etc., where corrosion is caused by moisture entrapment. Stress corrosion cracking in high strength components was discovered occasionally. Standard fleet corrosion maintenance is accomplished in accordance with procedures provided in technical manuals. Paint and corrosion removal procedures and tools are discussed. N.W.

N82-17351# Royal Air Force, Dereham (England). Central Servicing and Development Establishment.
DETECTION AND PREVENTION OF CORROSION IN ROYAL AIR FORCE AIRCRAFT
C. R. Pye *In* AGARD Aircraft Corrosion Aug. 1981 10 p

Avail: NTIS HC A09/MF A01

The problems that sometimes are created by corrosion in Royal Air Force aircraft are outlined. The problem of the harsh environment facing some military aircraft is described, and some of the materials used in aircraft construction are considered. Corrosion prevention and rectification is also discussed briefly. Some typical examples of corrosion damage found during service are illustrated, and the nondestructive testing methods used for detecting corrosion are described. These methods include visual inspection, eddy current techniques, ultrasonic techniques and X-radiography. The use of neutron radiography and other future developments is also considered. Service methods of removing corrosion and re-protecting the aircraft are mentioned. Finally the need for the manufacturer to consider corrosion at the aircraft design stage is considered. N.W.

N82-17352# British Airways, Middlesex (England). Aircraft Engineering (Structures).
AN AIRLINE VIEW OF THE CORROSION PROBLEM
R. G. Mitchell *In* AGARD Aircraft Corrosion Aug. 1981 11 p

Avail: NTIS HC A09/MF A01

Although the corrosion phenomenon is well understood by aircraft manufacturers and operators alike, most current aircraft types continue to exhibit many of the fundamental corrosion defects shown by earlier designs. It is estimated that the total annual cost to IATA member airlines is around $100 million based on 1978 operations. Environmental and maintenance effects are important and should be fully understood in their importance in minimizing corrosive attack. In addition to the more common forms, filiform corrosion and microbiological contamination present hazards to aircraft operating in certain areas of the world. Temporary water displacing fluids are becoming common in their use, and subject to certain limitations are providing valuable short term protection. The FAA design rules require the effects of corrosion to be considered at the design stage which should result in an improved product for the operator. In addition the IATA document Guidance Material on Design and Maintenance Against Corrosion of Aircraft Structures specifies practices which should also improve the overall product. Author

N82-17353# Middle East Technical Univ., Ankara (Turkey).
SOME OBSERVATIONS ON THE CORROSION OF AIRCRAFT AT THE AIR FORCE BASE IN BANDIRMA, TURKEY
M. Doruk *In* AGARD Aircraft Corrosion Aug. 1981 8 p

Avail: NTIS HC A09/MF A01

The types and the causes of corrosion which have been observed primarily on aircraft of Type F-5A in Turkey are studied. Visual inspection showed many locations of concentration of corrosion. The vertical stabilizer attach angle (alloy 7075-T6) fails through exfoliation corrosion and galvanic attack in the bolt holes. Galvanic corrosion has also been observed around the jaw bolts under the main wings. Another case of exfoliation attack has been found on the uplock support rib (Alloy 7075-T6 or 7079-T6) in the main landing gear well. Damage in the honeycomb assembly which appears as a debonding between the honeycomb structure and the top plate has been regarded as a serious problem. Corrosion damage is attributed to the high corrosiveness of the atmosphere of Air Force Base laden with sea salt and polluted from industries in the neighborhood. Author

N82-17354# Technical Univ. of Istanbul (Turkey).
ON THE CORROSION PROBLEMS OF THE TAF F-5 AIRCRAFT
A. Inalhan *In* AGARD Aircraft Corrosion Aug. 1981 1 p

Avail: NTIS HC A09/MF A01

Corrosion problems of the F-5 aircraft in Turkey are examined. The importance of atmospheric effects are disputed. The investigation and conclusions are recounted. N.W.

N82-17355# Service Techniques des Programmes Aeronautiques, Paris (France).
THE EXPERIENCE OF CORROSION ON FRENCH MILITARY AERODYNES [L'EXPERIENCE DE LA CORROSION SUR AERODYNES MILITAIRES FRANCAIS]
Melle M. Huret *In* AGARD Aircraft Corrosion Aug. 1981 9 p In FRENCH
Avail: NTIS HC A09/MF A01

Several examples of corrosion occurring in French military aircraft in detail, e.g., honeycomb sections and metal-to-metal adhesively bonded structures were described. Information about the various measures which were taken to diminish the problem was given. The manufacturing specifications do not take care of all protection requirements. Furthermore, the paint systems which are applied are not the best available, or they have been applied in the wrong way. Bad sealing also occurs frequently. Other preventive measures, e.g., water displacing fluids, can given additional, short term, protection. N.W.

N82-17356# KLM Royal Dutch Airlines, Amsterdam (Netherlands).
DESIGN AND MAINTENANCE AGAINST CORROSION OF AIRCRAFT STRUCTURES
H. J. Versteegen and M. J. M. Versteeg *In* AGARD Aircraft Corrosion Aug. 1981 7 p

Avail: NTIS HC A09/MF A01

The publication 'Guidance Material on Design and Maintenance against Corrosion of Aircraft Structures' is reviewed. A

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 512 reports, journal articles, and other documents originally announced in April 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

An annual cumulative index will be published.

angle-of-attack range. The most significant feature of the fighter's flow field is the leading edge vortex that forms at low alphas, grows stronger, and moves inboard as alpha is increased. Upper surface blowing enhanced the lift on the wing in both stalled and unstalled areas significantly, while generating only a modest aft shift in the center of pressure. Lift gains were greatest at high alphas and with the flap deflected. Spanwise blowing was most significant at angles-of-attack greater than 8 deg, when the jet strengthened the vortex. The 1100 F spanwise blowing jet mixed very rapidly with the wing flow field, creating a maximum temperature rise of only 300-350 F. A comparison of small-scale and large-scale model wing pressure characteristics showed similar trends created by upper surface blowing, while spanwise blowing characteristics differed considerably. Force data correlated well with semi-empirical predictions for gross thrust coefficients less than 1.0. J.F.

A82-19208 * # **Large-scale wind tunnel tests of a sting-supported V/STOL fighter model at high angles of attack.** F. Stoll (NASA, Ames Research Center, Helicopter and Powered Lift Technology Div., Moffett Field, CA) and E. A. Minter (Vought Corp., Dallas, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2621*. 12 p. 6 refs.

A new sting model support has been developed for the NASA/Ames 40- by 80-Foot Wind Tunnel. This addition to the facility permits testing of relatively large models to large angles of attack or angles of yaw depending on model orientation. An initial test on the sting is described. This test used a 0.4-scale powered V/STOL model designed for testing at angles of attack to 90 deg and greater. A method for correcting wake blockage was developed and applied to the force and moment data. Samples of this data and results of surface-pressure measurements are presented. (Author)

A82-19209 * # **Quiet Short-Haul Research Aircraft - The first 3 years of flight research.** J. A. Cochrane, D. W. Riddle, and V. C. Stevens (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2625*. 18 p. 9 refs.

NASAs first three years of flight research in an investigation of terminal area flight operation with the Quiet Short-Haul Research Aircraft (QSRA) are presented. An initial flight and modification program was devoted to improving the capabilities of the QSRA and measuring its performance. Later programs included a joint program with the US Navy, a guest pilot program involving 23 pilots from 16 organizations, and a program to measure benefits of propulsive-lift to CTOL aircraft. Development flight research, complemented by the aircraft modification program, has resulted in improvements in the maximum lift coefficient of more than two units, and has greatly improved flight characteristics and handling qualities. D.L.G.

A82-19210 * # **Low speed testing of the inlets designed for a tandem-fan V/STOL nacelle.** R. C. Williams (NASA, Lewis Research Center, Cleveland, OH) and A. H. Ybarra (Vought Corp., Dallas, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2627*. 12 p. 5 refs.

An approximately 0.25 scale model of a tandem fan nacelle, designed for a subsonic V/STOL aircraft, was tested in a Lewis wind tunnel. Model variables included long and short aft inlet cowls and the addition of exterior strakes to the short inlet cowl. Inlet pressure recoveries and distortion were measured at pitch angles to 40 deg and at combinations of pitch and yaw to 30 deg. Airspeeds covered a range to 135 knots (69 m/sec). The short aft inlet with added strakes had the best aerodynamic performance and is considered suitable for the intended V/STOL application. (Author)

A82-19211 * # **Application of thrusting ejectors to tactical aircraft having vertical lift and short-field capability.** D. G. Koenig, F. Stoll, and K. Aoyagi (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2629*. 23 p. 41 refs.

The status of ejector development in terms of application to V/STOL aircraft is reported in three categories: aircraft systems and ejector concepts; ejector performance including prediction techniques and experimental data base available; and, integration of the ejector with complete aircraft configurations. Available prediction techniques are reviewed and performance of three ejector designs with vertical lift capability is summarized. Applications of the 'fuselage' and 'short diffuser' ejectors to fighter aircraft are related to current and planned research programs. Recommendations are listed for effort needed to evaluate installed performance. (Author)

A82-19212 * # **Airframe effects on top-mounted inlet systems for VSTOL fighter aircraft.** D. B. Smeltzer, W. P. Nelms, and T. L. Williams (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2631*. 10 p. 8 refs.

Inlet flow-field and compressor-face performance data were obtained for a 0.095-scale model of a VSTOL fighter-attack aircraft configuration with twin top-mounted inlets. Tests were conducted at Mach numbers from 0.6 to 2.0 and at angles of attack and sideslip up to 27 deg and 12 deg, respectively. The effects of inlet location, wing leading-edge extension planform area, canopy-dorsal integration, and variable incidence canards were determined. The results show that distortion at the compressor face when maneuvering is relatively low (20% or less) at Mach numbers up to 0.9. However, at Mach numbers of 1.2 and above, maneuverability may be restricted because of high distortion or low pressure recovery (80% or less) or both. (Author)

A82-19213 * # **Thrust modulation methods for a subsonic V/STOL aircraft.** R. R. Woollett (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2633*. 17 p.

Attention is given to four techniques for attaining thrust modulation, namely (1) varying the engine rotational speed; (2) varying the fan nozzle exit area; (3) changing the thrust of the propulsion system by using a variable pitch rotor; and (4) changing the thrust by means of variable inlet guide vanes. The thrust modulation range, thrust level, and blade stresses are examined for each of the thrust modulation systems. Results are shown at the high angles of attack associated with tilt-nacelle V/STOL aircraft. Finally, the interrelationship between the inlet and the thrust modulation system is illustrated for two inlet types. C.R.

A82-19214 * # **Comparison of two parallel/series flow turbofan propulsion concepts for supersonic V/STOL.** R. W. Luidens, G. E. Turney, and J. Allen (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2637*. 15 p. 5 refs.

The thrust, specific fuel consumption, and relative merits of the tandem fan and the dual reverse flow front fan propulsion systems for a supersonic V/STOL aircraft are discussed. Consideration is given to: fan pressure ratio, fan air burning, and variable core supercharging. The special propulsion system components required are described, namely: the reflecting front inlet/nozzle, the aft subsonic inlet, the reverse pitch fan, the variable core supercharger and the low pressure forward burner. The potential benefits for these unconventional systems are indicated. (Author)

A82-19215 # **VTOL as it applies to resource development in the Canadian north.** R. N. Lightfoot (UMA Group, Edmonton, Alberta, Canada). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2640*. 18 p. 58 refs.

It is pointed out that, for many of the natural resource development projects planned in Canada between now and the end of the century, it may be necessary for the work force to commute to the site by air. Examples of successful operations, including those involving VTOL, are given. A computer program developed for determining the least expensive type of aircraft for commuting to remote projects is described. It is noted that the program can select both fixed-wing and helicopter aircraft types for a specific project, employing such variables as the size and shift schedules of the work force and the commuting distance. Capital and operating costs of existing and proposed aircraft types, as well as groundside infrastructure operations and maintenance costs, are compared for competing aircraft. C.R.

A82-19216 * # **Concept definition and aerodynamic technology studies for single-engine V/STOL fighter/attack aircraft.** W. P. Nelms and D. A. Durston (NASA, Ames Research Center, Aircraft Aerodynamics Branch, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2647.* 28 p. 15 refs.

The results obtained in the early stages of a research program to develop aerodynamic technology for single-engine V/STOL fighter/attack aircraft projected for the post-1990 period are summarized. This program includes industry studies jointly sponsored by NASA and the Navy. Four contractors have identified promising concepts featuring a variety of approaches for providing propulsive lift. Vertical takeoff gross weights range from about 10,000 to 13,600 kg (22,000 to 30,000 lb). The aircraft have supersonic capability, are highly maneuverable, and have significant short takeoff overload capability. The contractors have estimated the aerodynamics and identified aerodynamic uncertainties associated with their concepts. Wind-tunnel research programs will be formulated to investigate these uncertainties. A description of the concepts is emphasized. (Author)

A82-19217 # **Sea based support aircraft alternatives.** R. T. Priestley and A. R. Yackle (Lockheed-California Co., Burbank, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2649.* 10 p. 5 refs.

Multi-mission, CTOL, STOL and V/STOL aircraft concepts were sized for the Navy ASW/ASUW missions and comparatively evaluated. Initially, technology levels in the areas of lift, control systems, propulsion, advanced materials and avionics were established for the early 1990's. The aircraft were compared to determine the impact of multi-mission requirements, operational considerations, chiefly takeoff mode, as well as the technology advancements. Results presented include performance envelopes, weight statements, growth factors, impact of technology on weight reduction and the impact of design constraints. (Author)

A82-19218 # **Design features of a sea-based multipurpose V/STOL, STOVL, and STOL aircraft in a support role for the U.S. Navy.** G. W. Bradfield (General Dynamics Corp., Fort Worth, TX). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2650.* 9 p.

Design features and certain performance data are outlined for three different basic airframes. The heart of the design is a powered lift system known formally as the Advanced Blown Lift Enhancement system. A summary of the results of both powered-model wind tunnel tests of the airplane and of static tests of the vectoring-nozzle system is given to indicate the rather high degree of thrust vectoring efficiency and powered lift enhancement attained. C.R.

A82-19219 # **Application of the ABC helicopter to the emergency medical service role.** L. S. Levine (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2653.* 18 p. 23 refs.

Attention is called to the use of helicopters in transporting the sick and injured to medical facilities. It is noted that the helicopter's speed of response and delivery increases patient survival rates and may reduce the cost of medical care and its burden on society. Among the vehicle characteristics desired for this use are a cruising speed of 200 knots, a single engine hover capability at 10,000 ft, and an absence of a tail rotor. Three designs for helicopters incorporating such new technologies as digital/optical control systems, all composite air-frames, and third-generation airfoils are presented. A sensitivity analysis is conducted to show the effect of design speed, mission radius, and single engine hover capability on vehicle weight, fuel consumption, operating costs, and productivity. C.R.

A82-19220 * # **Analysis of selected VTOL concepts for a civil transportation mission.** S. B. Wilson, III, J. V. Bowles, and J. D. Foster (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2655.* 19 p. 15 refs.

As part of defining the needs and technology requirements for VTOL aircraft research and development, the objective of this paper is to study the application of two tilt propulsion concept VTOL aircraft to the business/executive transport mission. The two concepts selected for study are the tilt jet concept utilizing rotating turbofan engines for both vertical lift and cruise thrust, and the tilt rotor concept using relatively low disc loading propellers for hover and cruise. Overall mission costs, including the time-value cost of the executives, was computed for a selected range of mission distances, up to the design mission range of 750 nm (1400 km). The total trip cost was also compared to that of a conventional helicopter/business jet combination for a typical executive transport mission. (Author)

A82-19221 * # **A real time Pegasus propulsion system model for VSTOL piloted simulation evaluation.** J. R. Mihaloew (NASA, Lewis Research Center, Cleveland, OH), S. P. Roth, and R. Creekmore (United Technologies Corp., Government Products Div., West Palm Beach, FL). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2663.* 18 p. 6 refs.

A Pegasus-Harrier propulsion system is selected as a baseline for developing mathematical modeling and simulation techniques for VSTOL. Initially, static and dynamic propulsion system characteristics are modeled in detail to form a nonlinear aerothermodynamic digital computer simulation of a Pegasus engine. From this high fidelity simulation, a real-time propulsion model is formulated by applying a piecewise linear state variable methodology. A hydromechanical and water injection control system is also simulated. It is noted that the real-time dynamic model includes the detail and flexibility required for evaluating critical control parameters and propulsion component limits over a limited flight envelope. C.R.

A82-19234 **Utilization of hybrid computational equipment for the simulation of parachute system flight.** W. H. Curry and P. R. Schatzle (Sandia National Laboratory, Albuquerque, NM). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 143-147. 5 refs. Research supported by the U.S. Department of Energy.

Some computational programs which ordinarily would be run on large-scale, all-digital central computing equipment could also be implemented on hybrid computing equipment located in dedicated facilities such as, for example, aerospace flight simulation laboratories. Advantages would be cost-effective use of equipment and, in many cases, shorter run time. A description is presented of the utilization of a hybrid computer for parachute system flight simulation, taking into account some typical results. The described simulations were programmed for hybrid computer facilities which include fully expanded AD/FIVE analog computers interfaced to a PDP11/60 digital computer with a 64-kiloword core and two 2.5 megaword disks. G.R.

A82-19244 **KC-135 avionics modernization hot bench - An evaluation of requirements and design for the future.** S. J. Cristiani (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p. 338-340.

The U.S. Air Force has been extending the operational capabilities and useful life of its KC-135 air refueling fleet through a series of improvements. In order to evaluate various options for avionics system design, projects were initiated with the Directorates of Avionics Engineering (ENA) and Equipment Engineering (ENE). Attention is given to the development of the Avionics Modernization Hot Bench (AMHB). This effort is providing the technical data base for near term KC-135 avionic updates and for charting the long-term roadmap for future updates. The Hot Bench consists of a mix of actual avionics hardware (e.g., computers, displays) and software

Hounslow, Middx., England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 13 p.

In order to carry maximum payload at minimum cost, an airline must find means of optimizing fuel purchasing, pre-flight planning, and in-flight procedures. Accurate forecasting and monitoring of fuel costs is needed to obtain adequate fuel supplies at the best price, to maximize uplift at cheap stations, and to show the effect of outages of uplift stations. Pre-flight planning is used to determine the route for minimum fuel consumption and to calculate the maximum take-off weight. Minimization of fuel consumption during flight can be achieved by (1) presentation of optimum climb, cruise and descent information; (2) flight management systems coupled to the autopilot; (3) optimizing the use of engine climb derate; (4) improving navigational accuracy; (5) presentation of more navigation parameters to the pilot; (6) vertical navigation; and (7) minimizing noise and fuel consumption on approach. J.F.

A82-20519 **The FS2 RAE Bedford civil flight research programme.** R. W. Jones and R. C. Rawlings (Royal Aircraft Establishment, Bedford, England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 11 p. 12 refs.

The RAE/FS2 Bedford Civil Avionics Flight Research Program is aimed at studying the individual component systems for flight control, navigation, display, and flight management and at integrating these systems for optimum air traffic control (ATC). Modern equipment can provide accurate automatic navigation in four dimensions, and electronic displays can improve methods of displaying information to the flight crew as well as improve interaction between pilot/ATC and automatic navigation systems. Radar monitoring will be needed to ensure the meeting of safety standards, and monopulse SSR will provide an improved method of tracking and identifying aircraft. More use will be made of high level stacking to provide the airspace necessary to handle more aircraft and to reduce fuel wastage. The ADSEL/DABS system reduces garbling and provides a suitable data link to pass ATC requirements and wind data to the aircraft as well as aircraft derived parameters to the ATC. J.F.

A82-20520 **Thrust management - Current achievements and future developments.** J. L. Weston (Smiths Industries Aerospace and Defence Systems Co., Cheltenham, Glos., England). In: Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981. London, Royal Aeronautical Society, 1981. 12 p.

A system architecture has been developed to provide a fuel efficient full-flight regime auto-throttle system and a second generation flight management computer system. The auto-throttle system is capable of controlling the engine throttle levers from before take-off until touchdown as well as providing command signals to the aircraft flight director system. The operation modes of the system include take-off, climb, cruise, descent, maximum continuous thrust, hold, approach and go-around. The flight management computer system is responsible for the overall operation of the aircraft between the take-off location and the destination point. Its eight major functions are (1) flight planning; (2) navigation; (3) control of VOR/DME receivers; (4) lateral guidance; (5) vertical path optimization; (6) vertical guidance; (7) look ahead information; and (8) provision of information to support the electronic flight instrument system. J.F.

A82-20521 **Pactec V - Plastics technology advances/1980 update; Proceedings of the Fifth Annual Pacific Technical Conference, Los Angeles, CA, February 26-28, 1980. Volume 3.** Conference sponsored by the Society of Plastics Engineers. Greenwich, CT, Society of Plastics Engineers, Inc.; El Segundo, CA, Technology Conferences, 1981. 257 p. $17.50.

The latest contributions to the scientific and engineering knowledge of plastics are discussed under the headings of reinforced plastics and composites, structural foams, and plastics in building. Papers presented include: conductive prepregs for lightning strike protection of aircraft, fatigue behavior of selected nonwoven fiber composites for helicopter rotor blades, conductive plastics for EMI shielding, recent advances in plastic concrete, and thermoplastics in solar energy. V.L.

A82-20523 **Conductive prepregs for lightning strike protection on aircraft.** G. L. Patz (Hexcel Corp., Dublin, CA). In: Pactec V - Plastics technology advances/1980 update; Proceedings of the Fifth Annual Pacific Technical Conference, Los Angeles, CA, February 26-28, 1980. Volume 3. Greenwich, CT, Society of Plastics Engineers, Inc.; El Segundo, CA, Technology Conferences, 1981, p. 15-22.

A prepreg system has been developed which is capable of dissipating a full 200,000 amp lightning strike. The prepreg system is based on an E-glass fiber which has a continuous uniform coating of pure aluminum chemically bonded to the glass filament. Simulated lightning tests of a series of aircraft-skin-type sandwich panels on which the new prepreg was used as a surface ply over graphite, Kevlar, and glass prepreg systems have shown that the tested material is capable of conducting lightning currents without undue structural damage. Preliminary testing has also shown that there is no appreciable galvanic cell interaction between the outer ply and the graphite substructure. V.L.

A82-20524 **Fatigue behavior of selected non-woven fiber composites for helicopter rotor blades.** J. W. Davis and G. J. Sundsrud (3M Co., Structural Products Dept., St. Paul, MN). In: Pactec V - Plastics technology advances/1980 update; Proceedings of the Fifth Annual Pacific Technical Conference, Los Angeles, CA, February 26-28, 1980. Volume 3. Greenwich, CT, Society of Plastics Engineers, Inc.; El Segundo, CA, Technology Conferences, 1981, p. 23-38.

A number of variables characterizing nonwoven glass-reinforced composites used for propeller and rotor blade structures have been studied in order to determine which of the many raw material variables could contribute to improving the fatigue properties of the composite. The properties investigated included variations in resin, glass type, glass supplier, glass finish, glass monofilament diameter, and fiber bundle size. Both unidirectional and 45-degree orientations were used in tensile fatigue tests. The study has produced a series of thirty-one alternating stress vs cycle to failure curves for the raw material variables investigated. V.L.

A82-20526 **Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981.** Symposium sponsored by the Royal Aeronautical Society. London, Royal Aeronautical Society, 1981. 116 p.

The state-of-the-art in flight simulator trainers is examined, with consideration given to both commercial and military uses of simulators. Training with simulators by the RAF, the French Air Force, and the USAF is explored, and attention is paid to commercial pilot training for airlines and in general aviation aircraft. Specific mention is made of simulators for crew member training for the Nimrod helicopter and for the B-52 bomber. The employment of simulators by aircraft manufacturers is discussed, including the automation of in-flight simulation of data handling and validation testing of the simulator programs. The effects of simulators on advanced aircraft technology is explored, as are advances in simulation, in visual representation technology, and the direction of civil simulation, particularly for the case of satisfying FAA Phase III requirements. M.S.K.

A82-20527 **The simulator and the airline pilot.** G. T. Lavery (British Air Line Pilots Association, Hayes, Middx., England). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981. London, Royal Aeronautical Society, 1981. 6 p.

The purposes, a summary, and future goals of pilot simulator training techniques are reviewed. Simulators eliminate the expense of flying an actual aircraft for many hazardous operating experiences, can be used regardless of weather conditions, allows repetitive exposure to abnormal situations, and allows the instructor to be close-at-hand. Simulators are noted to often lack fidelity in terms of power applications and yaw, magnitude of response to configuration changes and drag changes, instrument reproduction, visual system response, and accurate aircraft cabin noises. Persisting problems are stressed as down-time for the simulators, lack of use of simulators for practice instead of as a testing tool only, and lack of authentic parts in the cockpit. Future necessities for actual zero-flight time training are outlined, and methods for training for flying different types of aircraft to maximize shifts of trained abilities are suggested. M.S.K.

A82-20528 **The use of flight simulators in l'Armée de l'Air.** F. Lemarchal (Ministère de la Défense, Etat-Major de l'Armée de l'Air, Paris, France). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981.
London, Royal Aeronautical Society, 1981. 3 p.

Various aspects of the use of flight simulators by the French air force are examined, noting a decrease in fuel expenditures by use of the trainers. Proficient control of the aircraft is considered essential to making maximum use of other sophisticated instrumentation such as advanced radars and missile store indicators. Flying time is eliminated during take-off and runway circuit training, and human factor accident rates are decreased by exposing the pilots to critical situations, as well as recovery procedures, before actual flying begins. The deployment of simulators among service divisions is outlined, and current programs in operation are described. Finally, the French air force combat simulator is discussed, including its advantages for repetitive exposure, adjustments in the flight envelope to fit the students' abilities, and comprehensive instrumentation replication. M.S.K.

A82-20530 **The aircraft manufacturer's needs as a simulator user.** J. W. Martz (Boeing Commercial Airplane Co., Renton, WA). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981. London, Royal Aeronautical Society, 1981. 6 p.

The use of flight simulators by the aerospace industry is examined. Aircraft manufacturers use engineering and flight training simulators, and also test facilities and equipment rigs for each developmental phase of a craft. The test facilities include wind tunnels, a system integration test facility, cabin air supply mock-up, engineering mock-ups, etc. Actual flight simulators are divided into one unit for acquainting the pilot with primary instrumentation and the electro-hydraulic force feel, another with the electro-hydraulic system and a three degrees-of-freedom motion base, and other units for differing numbers of crew members, all equipped with digital avionics and systems integration. Boeing is noted to be preparing simulators with six degrees of freedom for simulation of flight conditions on the 727, 737, 757, and 767 aircraft, with training curricula available for pilots having anywhere from 300 to 20,000 hr of experience. M.S.K.

A82-20531 **ASW and weapon system simulation with reference to the Nimrod MR Mk2 maritime crew trainer.** K. Wells (Marconi Space and Defense Systems, Ltd., Stanmore, Middx., England). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981. London, Royal Aeronautical Society, 1981. 5 p.

The features and operational characteristics of the Mk 1 and Mk 2 training simulators for the Nimrod helicopter crew members are described. The Maritime Crew Trainer (MCT) for the Mk 1 system fully simulates sonar, ESM, radar, MAD, communications, routine and tactical navigation, and weapons management. Crew members are supplied with alphanumeric displays and a keyboard, and the instructor can direct a full range of targets, operational conditions, and instrument faults. Improvements to the Mk 2 facility include digital provisions for ASW operations, navigational interlinks with the sonar and radar system, and weapons systems management. Further additions in sonar and radar target, environmental, sonobuoy, and receiver-transmitter simulation are outlined, and a recommendation is given that simulators be designed with same requirements as the aircraft they simulate. M.S.K.

A82-20532 **Automation in flight simulation of data handling and validation testing.** J. Shlien (CAE Electronics, Ltd., Montreal, Canada). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981.
London, Royal Aeronautical Society, 1981. 11 p.

The use of automated simulation devices to effect heightened fidelity in the transfer of actual operational aircraft parameters to training simulators is discussed. The automated hardware use digital processing, allowing consideration of large volume data points of lateral to longitudinal cross-coupling, complicated surface interference effects, ground effects, engine interference effects, and downwash effects. System inputs comprise a library listing of all breakpoints to be used, correlation of function to corresponding function, and the manufacturers' data points. There is no loss of data resolution, updates can be rapidly incorporated, and a direct traceability exists between the manufacturer's data and the simulator's files. FORTRAN is noted as the accepted software checking language, and the use of automated simulator six degree-of-freedom hardware is stressed as having released the instructor from having to verify the simulator program and allowed concentration on presenting actual critical flying conditions to the trainee. M.S.K.

A82-20533 **The effects on simulators of advances in aircraft technology.** J. Baradat (Thomson - CSF, Division Simulateurs, Trappes, Yvelines, France). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981.
London, Royal Aeronautical Society, 1981. 5 p.

Advances in flight technology which impinge on the design of flight simulators are discussed. The increase in control surfaces, automated flying modes, and digital avionics displays have increased the magnitude and complexity of the software data necessary for high-fidelity simulation. The characteristics of the transfer circuits are adapted to the aircraft equipment input-output characteristics, and simulators are required to provide freeze-frame capability, repetition of important flight phases, and time acceleration or jumps. The use of either common bus or arborescent architecture for the data processing is outlined, and attention is given to software updates, particularly for the autopilot, and the choice of software, specifically when a necessity arises for a manufacturer to yield aircraft software to the simulator manufacturer. M.S.K.

A82-20535 **Advanced simulation.** C. H. Huettner (FAA, Office of Flight Operations, Washington, DC). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981.
London, Royal Aeronautical Society, 1981. 6 p.

The Advanced Simulation Rule, the guidance implementing the Rule, the FAA National Simulator Evaluation Team, the status of other simulator evaluation activities, and future FAA simulator activities are discussed. The Phase II certification occurred in January 1981, and signalled the incorporation of realistic three-dimensional windshear dynamics, stopping and directional control forces for various runway conditions, braking dynamics, six degrees-of-freedom simulation, operational navigation, and aircraft cabin noise fidelity into pilot training simulators. Further cloud and lighting advances are described, and Phase III requirements are mentioned as including varying light and visual representations, weather anomalies, realistic colors, and weather radar. FAA circular 121-14C is outlined, the manner of using Phase I equipment to gain Phase II certification, and the functions of the nine FAA simulator evaluations specialists are examined. M.S.K.

A82-20536 **A European airline's future simulator requirements.** J. Meier (Swissair AG, Zurich, Switzerland). In: Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981. London, Royal Aeronautical Society, 1981. 13 p.

The features and operations of the Swissair DC-9-81 simulator are reviewed, and the Phase I, II, and III FAA requirements for simulators are discussed. The simulator software has been upgraded in the DC-9-81 to include ground reactions and handling, brake and antiskid modeling, ground proximity, atmospheric simulation, FORTRAN programming, and an improved motion program. Control feel and force have also been added to express the mass of control components, the dead band, breakout forces, autopilot forces, trim, opposite in sense to the tip vortex. The vortex-induced downwash outboard of the device serves to control the leading-edge stall development in the wing-tip regions. Wind-tunnel results on 60-deg and 74-deg flat-plate delta wings are presented to illustrate the operation of the pylon vortex generator in modifying the spanwise leading-edge separation characteristics resulting in effective alleviation of the pitch-up. (Author)

A82-22054 # **Isolated nacelle performance - Measurement and simulation.** J. L. Crook, D. P. Nelson, R. H. Wiley, and W. M. Presz, Jr. (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0134.* 10 p. 16 refs.

Results are presented from isolated flow through nacelle model tests which were conducted to acquire reliable data for computational nacelle performance prediction verification. The data includes static external and internal pressures, boundary layer rakes, hot film transition measurements, and momentum drag measurements. External surface pressure coefficients are compared against inviscid analytical predictions from state of the art transonic potential flow codes including non-conservative potential, conservative potential, and Euler solvers. Comparisons are made for free stream Mach numbers in the range of 0.71 to 0.84 and mass flow ratios between 0.54 and 0.80. Viscous predictions from an integral boundary layer technique are compared to measured transition location. Nacelle drag components are compared to an inviscid viscous analysis including pressure drag, additive drag, skin friction drag and total momentum loss. These analyses are shown to accurately predict nacelle drag, and drag trends with flow conditions and contour variations. (Author)

A82-22060 # **Basic studies of the flow fields of airfoil-flap-spoiler systems.** S. Bodapati, K. Karamcheti (Stanford University, Stanford, CA), and M. D. Mack (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0173.* 10 p. 6 refs.

Spoilers are used as lateral controls, speed brakes and lift dumpers during various stages of flight. The wakes created by the spoilers interact with horizontal tail and may cause buffet. A theoretical and experimental investigation has been undertaken at Stanford University to study steady and fluctuating flow fields of airfoil-flap-spoiler systems. A series of experiments have been conducted to investigate steady and fluctuating boundary layers, wakes and pressures. The results are being analyzed in conjunction with the unsteady Schlieren photographs and will be reported in different papers. Here a complete investigation relating various aspects including the design philosophy, instrumentation and data acquisition and analysis techniques will be reported and typical results will be discussed. (Author)

A82-22074 * # **High angle-of-attack characteristics of three-surface fighter aircraft.** M. A. Croom, S. B. Grafton, and L. T. Nguyen (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0245.* 11 p. 6 refs.

As part of a research program aimed at providing information on the high angle-of-attack characteristics of three-surface fighter concepts incorporating a close-coupled canard, an investigation is being conducted on two specific configurations based on the F-18 and F-15 designs. The study configurations are being subjected to a wide range of tests including wind-tunnel tests, dynamic model tests, and piloted simulation. This paper summarizes the results obtained to date in this study. High-alpha results in the areas of static stability, damping, and control characteristics are reviewed and some of the more significant aerodynamic phenomena are identified. (Author)

A82-22077 * # **Transonic perturbation analysis of wing-fuselage-nacelle-pylon configurations with powered jet exhausts.** J. C. Wai, H. Yoshihara (Boeing Co., Seattle, WA), and W. K. Abeyounis (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0255.* 16 p. 8 refs. Research supported by the Boeing Co; Contract No. NAS1-15887.

A transonic small perturbation method has been developed for the analysis of general wing-fuselage-nacelle-pylon configurations with powered jet exhausts. Finite difference successive line relaxation algorithm is used to solve the small disturbance potential equation in conservative form. The nacelle tangency condition and the jet exhaust plume contact conditions are fulfilled in a quasi-cylindrical fashion on a surface fitting the Cartesian grid. The pylon tangency condition is treated in a quasi-planar manner as for the wing. Viscous displacement effects on the wing are modeled by suitable shape changes including the placement of a viscous ramp at the base of the shock. Computed results of a transport configuration show satisfactory correlation with test data. (Author)

A82-22079 # **A simulator assessment of a wide field of view head-up display for presenting a FLIR sensor image during low level navigation and ground attack missions.** R. A. Cooke and J. C. Mabberley (Royal Aircraft Establishment, Flight Systems Dept., Farnborough, Hants., England). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0261.* 5 p.

The paper describes an initial simulator trial which will assess a very wide-angle head-up display and a thermal imaging system optimized for ground attack missions. An air-to-ground simulator developed for the trial is discussed in detail and results of early experiments are presented. It is found that the displayed image, general flight cues, and cockpit environment are realistic in terms of pilot operation and behavior, and thus, the facility described provides a valuable tool for assessing various trade-offs between system configurations and performance. V.L.

A82-22081 * # **Aerodynamic characteristics of airfoils with ice accretions.** M. B. Bragg and G. M. Gregorek (Ohio State University, Columbus, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0282.* 15 p. 19 refs. Grant No. NAG3-28.

Results of a wind tunnel test to evaluate the performance of an airfoil with simulated rime ice are presented with theoretical comparisons. A NACA 65A413 airfoil was tested in the OSU 6 x 22 inch Transonic Airfoil Wind Tunnel at a Reynolds number near three million and Mach numbers from 0.20 to 0.80. The model was tested in four configurations to determine the aero-dynamic effects of the roughness and shape of a rime ice accretion. The simulated rime ice shape was obtained analytically using a time-stepping dry ice accretion computer code. Lift, drag, moment coefficients, and pressure distributions for the clean and simulated rime ice cases are reported. The measured degradation in airfoil performance is compared to an analytical method which uses existing airfoil analysis computer codes with empirical corrections for the surface roughness. A discussion of the empirical surface roughness correction and uses of other airfoil computer methods is included. (Author)

A82-22082 # **A split coefficient/locally monotonic scheme for multishocked supersonic flow.** J. E. Daywitt, D. J. Szostowski (General Electric Co., Re-Entry Systems Div., Philadelphia, PA), and D. A. Anderson (Iowa State University of Science and Technology, Ames, IA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0287.* 14 p. 27 refs. Research sponsored by the General Electric Co.; Contract No. F04701-78-C-0104.

A new finite difference technique is developed for solving three-dimensional, steady, inviscid, supersonic, equilibrium real-gas flows with embedded shock waves. The technique employs the split coefficient matrix (SCM) method to solve the gasdynamic equations in the form of decoupled compatibility relations. In the SCM technique the coefficient matrices are split according to the sign of their eigenvalues. The derivatives associated with each split coefficient matrix are approximated by one-sided difference operators consistent with signal propagation paths. Results demonstrate that problems of conventional finite difference methods with non-orthogonal grids are alleviated in the SCM approach. In addition, solutions obtained using the SCM technique show that strong cross-flow gradients, including cross-flow shocks, can be accurately computed. To treat flows containing embedded stream-wise shock waves the SCM technique is replaced, at grid points detected to be in the vicinity of a shock, by the monotonic self-adjusting hybrid/artificial compression method (ACM). The governing equations are cast in conservation-law form in the shock-capturing ACM approach with damping terms added to eliminate post-shock oscillations. Stream-wise shocks of sufficient strength to cause conventional shock-capturing methods to fail are resolved using the combined SCM/ACM technique. (Author)

A82-22083 # **Measurements of a three-dimensional boundary layer on a sharp cone at Mach 3.** W. J. Yanta, D. W. Ausherman, and E. R. Hedlund (U.S. Navy, Naval Surface Weapons Center, Silver Spring, MD). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0289.* 11 p. 9 refs. Navy-sponsored research.

Three-dimensional boundary layer measurements were carried out on a 7 deg semi-vertex angle sharp cone for angles of attack of 0, 2 and 4 deg in the NSWC Supersonic Tunnel number 2 at a freestream Reynolds number of 2.3 x 10 to the 6th/ft. (7.0 x 10 to the 5th/m). Included were measurements of the mean U, V, and W velocity components for seven circumferential locations around the body and one axial station. These were obtained using a three-dimensional laser Doppler velocimeter. The flow was investigated in both the viscous and inviscid portions of the flow field, yielding information about the velocity profile behavior in both regions. In addition, skin friction measurements were made with a surface mounted Preston probe at five axial stations along the cone. The effects of angle of attack and body roll position on the three-dimensional boundary layer profiles and skin friction are discussed. (Author)

A82-22091 # **Propulsion system controls design and simulation.** E. Tjonneland and C. M. Carlin (Boeing Military Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0322.* 27 p. 11 refs.

A propulsion system real-time simulation facility was developed for the design, analysis, simulation and evaluation of propulsion control systems. The functional requirements for the facility, the implementation of these requirements, and the utilization of the facility in advanced control technology programs is described. A hybrid approach to plant simulation permits realization of the desired levels of portability, flexibility, computational accuracy, and reliability. Control development tools have been integrated into a facility to support the development of digital propulsion control systems as well as their integration with airframe control systems. The success of controls and simulation development depends largely on the attention to the detailed work tasks, and much of the computational technology has already been transferred to automated interactive minicomputer work methods. J.F.

A82-22094 * # **Steady and unsteady nonlinear hybrid vortex method for lifting surfaces at large angles of attack.** O. A. Kandil, L.-C. Chu, and T. Tureaud (Old Dominion University, Norfolk, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0351.* 14 p. 20 refs. Grant No. NsG-1560; Contract No. N62269-80-C-0704.

Steady and unsteady Nonlinear Hybrid Vortex (NHV) method, for low aspect ratio wings at large angles of attack, is developed. The method uses vortex panels with first-order vorticity distribution (equivalent to second-order doublet distribution) to calculate the induced velocity in the near field using closed form expressions. In the far field, the distributed vorticity is reduced to concentrated vortex lines and the simpler Biot-Savart's law is employed. The method is applied to rectangular wings in steady and unsteady flows without any restriction on the order of magnitude of the disturbances in the flow field. The numerical results show that the method accurately predicts the distributed aerodynamic loads and that it is of acceptable computational efficiency. (Author)

A82-22096 * # **Store separation from cavities at supersonic flight speeds.** R. L. Stallings, Jr. (NASA, Langley Research Center, High-Speed Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0372.* 6 p. 5 refs.

An experimental investigation has been conducted to determine the aerodynamic characteristics of a typical wing-control missile configuration during separation from a box-type cavity having depth to length ratios (D/L) ranging from 0.088 to 0.225. The cavity was located in a splitter plate that spanned the low Mach number test section of the Langley Unitary Plan Wind Tunnel. Aerodynamic characteristics are presented for Mach 2.36 and a free-stream unit Reynolds number of 2,000,000/ft. For the shallow cavity (D/L = 0.088), large interactions existed between the cavity and the flat plate flow field, which resulted in unfavorable separation characteristics for the missile model. For the deep cavity (D/L = 0.225), the flat plate flow field essentially bridged the cavity, resulting in minor interactions and favorable separation characteristics for the missile model. (Author)

A82-22110 # **Aerodynamic characteristics of maneuvering flaps.** B. Fang, B. Hu, H. Wang, and Y. Zhang (Shengyang Aircraft Corp., People's Republic of China). *Acta Aeronautica et Astronautica Sinica,* vol. 2, Sept. 1981, p. 1-13. In Chinese, with abstract in English.

Results of wind tunnel tests on the effects of aircraft maneuvering flaps are reported, specifically for reducing drag, and for the effects of the flap span, the flap chord, the strake, and the wing planform on the aerodynamics of the maneuvering flap. The matching of leading edge and trailing edge flaps, and the improvement in large angle of attack flying due to the presence of maneuvering flaps are discussed. Maneuvering flaps allow control of the flow separation and decrease drag at large angles of attack, and expand the buffet boundary and decrease the buffet intensity. Methods of incorporating the effects of the maneuvering flaps into the design of the aircraft structure and the control system are indicated. M.S.K.

A82-22111 # **Numerical calculation of lift, moment coefficient and dynamic stability derivatives on sideslipping wings in unsteady supersonic flows.** G. Zhang (Nanjing Aeronautical Institute, Nanjing, People's Republic of China). *Acta Aeronautica et Astronautica Sinica,* vol. 2, Sept. 1981, p. 14-22. In Chinese, with abstract in English.

This paper presents a numerical solution of unsteady supersonic flows for sideslipping wings by means of the characteristic lines network method of unsteady supersonic sources distributed on the wing plane. This paper provides the oscillating mode of undulatory, pitching-and-rolling harmonic oscillations of the wings with sideslip angles, and the methods to calculate its lift, moment coefficient, and dynamic stability derivatives. The dynamic stability derivatives of a typical wing with sideslip angle equal to zero were worked out both by analytical formula in conformity with the conventional quasi-stationary theory and by the present method, and were compared and examined. The results show that the present method is satisfactory. (Author)

A82-22112 # **Numerical computation of unsteady subsonic aerodynamic forces on wing-body-tail exposed to travelling gust.** G. Wen (Beijing University, Beijing, People's Republic of China) and Z. Sun (Air Force Laboratory, People's Republic of China). *Acta Aeronautica et Astronautica Sinica,* vol. 2, Sept. 1981, p. 23-30. In Chinese, with abstract in English.

The effects of unsteady subsonic aerodynamic forces on the wing-body-tail configuration and the interference effects between the components are examined numerically. A small angle of attack and a weak shock is assumed, and a linear method for the moving vortex finite element solution is employed to solve an initial boundary value problem of the wave equation. A set of algebraic equations is solved at each time interval, and numerical calculations are performed for various blast orientations, elevation angles, and different complex planforms. The derived lift coefficients for wing-body configurations are found to match experimental data, while convergence was not obtained for the complex planform for the variations of lift and moment coefficients. M.S.K.

A82-22120 # **The simulation study on a redundant flight control system.** D. Xue (Institute of Automatic Flight Control, People's Republic of China). *Acta Aeronautica et Astronautica* description of the functional operation of the interconnecting MIL-STD-1553A multiplex communications system. The development process for the Operational Flight Program (OFP) for the Central mission computers is described and the support facilities which were used for the software integration and validation are discussed. A.R.H.

N82-17120# Naval Weapons Center, China Lake, Calif. F-18 Facility Branch.
F/A-18 WEAPONS SYSTEM SUPPORT FACILITIES
Thomas F. O'Neill *In* AGARD Tactical Airborne Distributed Computing and Networks Oct. 1981 7 p

Avail: NTIS HC A18/MF A01

The U.S. Navy is currently acceptance-testing the McDonnell Douglas F/A-18 aircraft. Since the F/A-18 is so much more complex than any aircraft current deployed, more sophisticated support tools will be required. The main support tool is to be a weapons system support facility including all of the hardware and software necessary to test, modify, and validate all of the avionics hardware, software, and firmware. A distributed processing approach is used in the facility, which contains several minicomputers and super minicomputers. Author

N82-17121*# Hughes Helicopters, Culver City, Calif.
BLADE PLANFORM FOR A QUIET HELICOPTER Final Report
D. S. Janaki Ram Sep. 1980 31 p refs
(NASA Order A-65550B)
(NASA-CR-166256; T-35584) Avail: NTIS HC A03/MF A01 CSCL 01C

The effects of blade planform and tip speed on noise and performance for a Hughes 500 C rotor system were studied. A cursory examination of the effects of such planform shapes as regular, inverse, and no taper on the noise and performance of the rotor was conducted. It was found that a constant width wide chord planform at tower tip speed provided the best performance and lowest noise. The tapered planforms had lower performance figures due to the reduced solidity. However, some noise reductions were achieved. R.J.F.

N82-17122*# McDonnell-Douglas Corp., St. Louis, Mo.
TESTS OF A D VENTED THRUST DEFLECTING NOZZLE BEHIND A SIMULATED TURBOFAN ENGINE Final Report
T. L. Watson Washington NASA Jan. 1982 139 p refs
(Contract NAS3-21733)
(NASA-CR-3508; MDC-A6930) Avail: NTIS HC A07/MF A01 CSCL 01A

A D vented thrust deflecting nozzle applicable to subsonic V/STOL aircraft was tested behind a simulated turbofan engine in the verticle thrust stand. Nozzle thrust, fan operating characteristics, nozzle entrance conditions, and static pressures were measured. Nozzle performance was measured for variations in exit area and thrust deflection angle. Six core nozzle configurations, the effect of core exit axial location, mismatched core and fan stream nozzle pressure ratios, and yaw vane presence were evaluated. Core nozzle configuration affected performance at normal and engine out operating conditions. Highest vectored nozzle performance resulted for a given exit area when core and fan stream pressure were equal. Its is concluded that high nozzle performance can be maintained at both normal and engine out conditions through control of the nozzle entrance Mach number with a variable exit area. E.A.K.

N82-17123# National Aerospace Lab., Tokyo (Japan).
A NEW METHOD OF ESTIMATING THE LATERAL WALL EFFECT ON THE AIRFOIL INCIDENCE DUE TO THE SUCTION AT SIDE WALLS
Hideo Sawada, Seizo Sakakibara, Mamoru Sato, Hiroshi Kanda, and Toshio Karasawa Aug. 1981 20 p refs In JAPANESE; ENGLISH summary
(NAL-TR-680; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

The velocity component is approximated from the pressure difference across the plates by the aid of an experimental equation which states that the normal velocity component to a porous plate induced by the pressure difference across the plate is proportional to the square root of the pressure difference. In this method, the proportional constant number need not be known. An experiment was carried out in which the pressure in a suction box, one side of which consisted of a porous plate, was set at various values in this experiment. The lift coefficient of an airfoil model changed with the variation of the pressure in the suction box even at the same uniform flow speed and the same incidence. The unique value of the lift coefficient was determined from several such lift coefficients at the same incidence. The corrected lift coefficient curve obtained is very close to one obtained in a test section with fully solid side walls. T.M.

N82-17124# National Aerospace Lab., Tokyo (Japan). STOL Aircraft Project Group.
SURVEYS OF FLOW-FIELD AROUND EMPENNAGE OF THE NAL STOL-RESEARCH-AIRCRAFT MODEL
Jul. 1981 80 p refs In JAPANESE; ENGLISH summary
(NAL-TR-677; ISSN-0389-4010) Avail: NTIS HC A05/MF A01

The flow field around the empennage for the STOL landing were measured. The down wash angle, the side wash angle, and the dynamic pressure at the aerodynamic center of the empennage were obtained by linear interpolation at the two sections perpendicular to the free steam. Effects of the engine thrust coefficient and the two types of vortex generator on the flow field, and the directional stability in the case of an inner engine becoming inoperative, were studied. E.A.K.

N82-17125# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering.
EXPERIMENTAL STUDY OF DELTA WING LEADING-EDGE DEVICES FOR DRAG REDUCTION AT HIGH LIFT M.S. Thesis
Thomas Dwight Johnson, Jr. Dec. 1980 139 p refs
Avail: NTIS HC A07/MF A01

Future fighter aircraft requirements specify efficient supersonic cruise and high-g maneuverability at high lift. The slender delta wing meets the first requirement but has large lift induced drag increments at high lift. One method to alleviate the drag is to control the flow at the wind leading edge (LE) by means of small LE devices, so as to maintain locally attached flow to higher angles of attack and thus increase the level of aerodynamic thrust. The devices selected for evaluation were the fence, slot, pylon-type vortex generator (VG), and sharp leading-edge extension (SLEE). These devices were tested on a 60 deg flatplate delta (with blunt LE) in the Langley Research Center (NASA) 7- by 10-foot high-speed tunnel at low-speed and to angles of attack of 28 degrees. Balance and static pressure measurements were taken. The results indicate that all the devices have significant drag reduction capability and improved longitudinal stability while a slight loss of lift and increased cruise drag occurred. T.M.

N82-17126*# George Washington Univ., Washington, D.C. School of Engineering and Applied Science.
EXPERIMENTAL TRIM DRAG VALUES FOR CONVENTIONAL AND SUPERCRITICAL WINGS M.S. Thesis
Peter Fredric Jacobs Dec. 1981 165 p refs Sponsored by NASA
(NASA-CR-168500) Avail: NTIS HC A08/MF A01 CSCL 01A

Supercritical wings were studied to determine whether they incur higher trim drag values at cruise conditions than wide body technology wings. Relative trim drag increments were measured in an experimental wind tunnel investigation. The tests utilized high aspect ratio supercritical wing and a wide body wing in conjunction with five different horizontal tail configurations, mounted on a representative wide body fuselage. The three low tail configurations and two T tail configurations were chosen to measure the effects on horizontal tail size, location, and camber on the trim drag increments for the two wings. The increase in performance (lift to drag ratio) for supercritical wing over the wide body wing was 11 percent for both the optimum low tail and T tail configurations. S.L.

N82-17127# Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
ROLL UP MODEL FOR ROTOR WAKE VORTICES, PART 5
Maarten Landahl Stockholm Aeronautical Research Inst. of Sweden 13 Nov. 1981 28 p refs
(Contract NE-5061-014)
(ASRL-TR-194-4; FFA-HU-2262-Pt-5) Avail: NTIS HC A03/MF A01

Conservation of momentum and energy is used to estimate the core size of a rolled-up vortex from a propeller or rotor blade tip. A simplified planar model due to Prandtl is employed to determine the strength, position, and core size of the rolled-up vortices. This model is valid when the number of blades is large

such that the distance between the wake vortex sheets is much less than the diameter of the rolled-up vortex spirals. The vortex is assumed to have a core of constant vorticity (Rankine vortex). Three dimensionality is then accounted for by modeling the actual spiral wake vortex as a row of regularly spaced vortex rings. The core diameter is found to be about 40 percent of this distance, with a slight decrease with increase in spacing-to-diameter ratio. The core velocity is found to increase with increased spacing from 0.5 of the wake velocity at zero spacing to about 0.7 of the wake velocity at a spacing of three times the wake radius.
Author

N82-17128# National Aerospace Lab., Amsterdam (Netherlands). Fluid Dynamics Div.

THEORY AND EXPERIMENT IN UNSTEADY AERODYNAMICS

H. Bergh, H. Tijdemann, and R. J. Zwaan 11 Dec. 1980 26 p refs Presented at Aeroelastic Colloq., Goettingen, West Germany, 24 Sep. 1980
(NLR-MP-80046-U) Avail: NTIS HC A03/MF A01

A historical review is given of the role of theory and experiment in investigations of unsteady aerodynamics. Author

N82-17129# National Aerospace Lab., Amsterdam (Netherlands). Dept. of Aeroelasticity.

A WIND TUNNEL STUDY OF THE FLUTTER CHARACTERISTICS OF A SUPERCRITICAL WING

R. Houwink, A. N. Kraan, and R. J. Zwaan 28 Jan. 1981 10 p refs Presented at 22nd SDM/Dyn. Specialists Conf., Atlanta, 6-10 Apr. 1981 Sponsored by Netherlands Agency for Aerospace Programs Prepared in cooperation with Royal Netherlands Aircraft Factories Fokker, Amsterdam
(NLR-MP-81002-U) Avail: NTIS HC A02/MF a01

A wind-tunnel flutter test on a supercritical wing model is described. Objectives of the test were to investigate the transonic dip and to enable comparison with calculated flutter characteristics in which a quasi-three dimensional transonic theory was used. The beginning of a transonic dip was measured and a satisfactory agreement with theory could be found. An additional flutter instability in the bottom of the transonic dip could be correlated with the loose of transition strip effectivity at low Reynolds numbers.
Author

N82-17131# Ohio State Univ., Columbus. Dept. of Mechanical Engineering.

DEVELOPMENT OF A COMPUTER BASED PRESENTATION OF NON-STEADY HELICOPTER ROTOR FLOWS Interim Report, 1 Jul. 1979 - 30 Apr. 1981

Henry R. Velkoff and Richard R. Navarro Sep. 1981 121 p refs
(Contract DAAG29-79-C-0074)
(AD-A108107; ARO-14142.6-EX; OSURF-761646/711999) Avail: NTIS HC A06/MF A01 CSCL 01/3

A system to measure the non-steady velocities in the model rotor wake was modified to provide velocity data in a form more useful to the user of the data. Hot wire angle parameters were modified so as to provide better correlations by using cosine law in place of the usual K-squared technique common in hot-wire anemometry. The results of the non-steady measurements were presented in the form of motion pictures of the non-steady computer generated vector plots. Author (GRA)

N82-17132# Ohio State Univ., Columbus. Dept. of Mechanical Engineering.

ROTOR FLOW RESEARCH IN LOW SPEED HELICOPTER FLIGHT Final Report, 1 Jul. 1979 - 30 Apr. 1981

Henry R. Velkoff Sep. 1981 24 p refs
(Contract DAAG29-79-C-0074)
(AD-A107873; ARO-14142.7-EX) Avail: NTIS HC A02/MF A01 CSCL 20/4

Measurements of helicopter rotor wake flow were made at low advance ratio. Both steady and non-steady data were taken in the wake using 3-D hot-film anemometry. Emphasis was placed on the presentation of the data. Motion pictures were obtained from the computer plots of the experimental velocity data.
Author (GRA)

N82-17133# Ohio State Univ., Columbus. Dept. of Mechanical Engineering.

NON-STEADY VELOCITY MEASUREMENT OF THE WAKE OF A HELICOPTER ROTOR AT LOW ADVANCE RATIOS Interim Report, 1 Jul. 1979 - 30 Apr. 1981

H. R. Velkoff and H. Terkel Sep. 1981 127 p refs
(Contract DAAG29-79-C-0074)
(AD-A107722; ARO-14142.5-EX; OSURF-761646/711999) Avail: NTIS HC A07/MF A01 CSCL 20/4

A system was developed which could measure the instantaneous velocities in the wake of a model helicopter rotor operating at low advance ratios. A three-wire hot film probe was mounted on a traverse and placed at many positions in the wake. The output of the probe was fed into an on-line computer operating in an interactive mode. Computer generated vector plots were made of both time averaged velocities and instantaneous velocities for the case of mu = 0.06.
Author (GRA)

N82-17134# Calspan Field Services, Inc., Arnold Air Force Station, Tenn.

EXPERIMENTAL VERIFICATION OF AN AERODYNAMIC PARAMETER OPTIMIZATION PROGRAM FOR WIND TUNNEL TESTING Final Report, Oct. 1980 - Sep. 1981

Richard L. Palko and Margaret Anne Crawford AEDC Nov. 1981 32 p refs
(AD-A107727; AEDC-TR-81-23) Avail: NTIS HC A03/MF A01 CSCL 20/4

The optimization algorithm developed for the SOFT wing program has been revised to make it more applicable for use in routine wind tunnel testing. The algorithm modification removed some unused routines and simplified the control input requirements. The modified optimization algorithm was demonstrated in the 1-ft transonic Aerodynamic Wind Tunnel (1T) using a 3-degree-of-freedom model. The test Mach number was 0.8. The algorithm was successfully demonstrated for all three optimization runs attempted. These included minimization of drag coefficient for a specified coefficient of lift, maximization of lift coefficient for a specified coefficient of drag, and maximization of lift-to-drag ratio for a specified coefficient of drag.
Author (GRA)

N82-17136# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium). Aeronautics and Aerospace Dept.

FINITE DIFFERENCE COMPUTATION OF THE CONICAL FLOW FIELD OVER A DELTA WING

L. Vigevano Aug. 1981 55 p refs
(VKI-TN-140) Avail: NTIS HC A04/MF A01

A numerical approach using finite differences applied to a nonlinear governing equation was adopted in order to introduce compressibility effects in a model of the vertical flow past a sharp leading edge on a delta wing. A conical line vortices model was adapted to a through field computation. From numerical experiments, criteria for the representation of a mathematical vortex in a finite difference scheme are derived Comparison of the numercial results with the Brown and Michael analytical solution shows that the first order scheme employed preserves satisfactory accuracy in the prediction of the wing loads.
Author (ESA)

N82-17137*# Textron Bell Helicopter, Fort Worth, Tex.

ASSESSMENT OF HISTORICAL AND PROJECTED SEGMENTS OF US AND WORLD CIVIL AND MILITARY ROTORCRAFT MARKETS 1960 - 1990 Contractor Report, 2 Aug. 1981

William J. Yates 2 Aug. 1981 203 p
(Contract NAS2-10404)
(NASA-CR-166151) Avail: NTIS HC A10/MF A01 CSCL 05C

The future military and civil worldwide market potential for current and future rotorcraft configurations was assessed. Comparisons by region, mission, civil or military, etc., are made for both historial and forecast data. A comprehensive historical data base was utilized to determine historical and future trends. Consideration was given to socio-political, economic, and technological factors in determining future trends. Author

N82-17138# National Transportation Safety Board, Washington, D. C. Bureau of Accident Investigation.

AIRCRAFT ACCIDENT REPORT - UNIVERSAL AIRWAYS, INC., BEECH 65-A80/EXCALIBUR CONVERSION, N100UV, NEAR MADISONVILLE, TEXAS, JULY 2, 1981

17 Dec. 1981 25 p
(NTSB-AAR-81-17) Avail: NTIS HC A02/MF A01

About 1230 Central Daylight Time, on July 2, 1981, a Universal Airways, Inc. Beech 65-A80, N100UV, crashed into greater understanding among manufacturers and airline managements of the magnitude of the corrosion problems and the need for measures to be taken at the design stage is considered. The best available anti-corrosion design knowledge in critical areas as a basic standard is addressed. The guidelines cover basic requirements, including material choice, design principles and manufacturing procedures. Furthermore, they cover the critical areas including origin of problems, design objectives and protective requirements. They are supplemented by an appendix giving a detailed acceptable means of compliance. N.W.

N82-17357# Michigan State Univ., East Lansing. Dept. of Metallurgy, Mechanics, and Materials Science.

FORECASTING CORROSION DAMAGE AND MAINTENANCE COSTS FOR LARGE AIRCRAFT

R. Summitt and F. Fink *In* AGARD Aircraft Corrosion Aug. 1981 11 p refs Sponsored by AF

Avail: NTIS HC A09/MF A01

Studies relating environmental and operational factors of large aircraft to corrosion damage were conducted. They provide a basis for predicting maintenance costs and for logistics decisions. The studies included: (1) an Environmental corrosion severity index, based on pollutant and weather factors; (2) an atmospheric testing program to determine environmental corrosiveness; and (3) analysis of corrosion maintenance experience in aircraft systems. Results are discussed. M.D.K.

N82-17358# Royal Aircraft Establishment, Farnborough (England). Materials Dept.

CORROSION CONTROL MEASURES FOR MILITARY AIRCRAFT: PRESENT UK REQUIREMENTS AND FUTURE DEVELOPMENTS

V. C. R. McLoughlin *In* AGARD Aircraft Corrosion Aug. 1981 15 p refs

Avail: NTIS HC A09/MF A01

The philosophy behind selection of aircraft metallic materials based on resistance to corrosion and behind mandatory requirements for processes and materials used in the protection of aircraft structures is discussed. The impact of legislation, current and future, aimed at protecting the environment is reported. The necessity for finding replacements for cadmium, chromates, and various metal finishing operations used in aircraft construction is discussed in terms of both protecting the environment and corrosion control methods used in the aircraft industry. M.D.K.

N82-17359# Aeritalia S.p.A., Torino (Italy). G.V.C. Labs.

CORROSION PREVENTION METHODS DEVELOPED FROM DIRECT EXPERIENCE WITH AEROSPACE STRUCTURES

M. Scolaris *In* AGARD Aircraft Corrosion Aug. 1981 18 p

Avail: NTIS HC A09/MF A01

Some examples of various types of corrosion experienced during hardware service are reviewed and the significant remedial action adopted first to repair and then to eliminate the problem are presented. The changes in design incorporated during design development as a function of the experience and technical knowledge acquired are also presented. Examples of effective protection validated through service life and present trends for effective corrosion prevention are also illustrated. Author

N82-17360# Avions Marcel Dassault-Breguet Aviation, Saint-Cloud (France).

CORROSION PREVENTION MEASURES USED IN THE CONSTRUCTION OF AN AIRCRAFT AIRFRAME: THE CASE OF 2014 AND 2214 ALLOYS [SOLUTIONS PREVENTIVES UTILISEES CONTRE LA CORROSION LORS DE LA CONSTRUCTION D'UNE CELLULE D'AVION. CAS DES ALLIAGES 2014 ET 2214]

J. Bevalot *In* AGARD Aircraft Corrosion Aug. 1981 14 p In FRENCH

Avail: NTIS HC A09/MF A01

Discussions of practical aircraft corrosion problems are presented. Aluminum alloy 2214 is evaluated in terms of its resistance to stress corrosion and its excellent fatigue properties. Heat treatment, aging at 178 C instead of 153 C, and the use of wet sandblasting techniques are discussed in terms of maintaining fatigue resistance while increasing resistance to stress corrosion. M.D.K.

N82-17361# Naval Air Development Center, Warminster, Pa.

RECENT DEVELOPMENTS IN MATERIALS AND PROCESSES FOR AIRCRAFT CORROSION CONTROL

Sara J. Ketcham and John J. DeLuccia *In* AGARD Aircraft Corrosion Aug. 1981 9 p refs

Avail: NTIS HC A09/MF A01

Advances in materials and processes for aircraft corrosion control currently in use and those under development in the laboratory for future use are described. Areas covered are corrosion preventive compounds, organic and inorganic coatings, alloy selection and heat treatments. Available materials highlighted are water displacing compounds, sealant primers, aluminum alloys 7050 and 7010 including a state-of-the-art report on the use of exfoliation and stress corrosion resistant tempers. Materials under development that offer promise of contributing to future advances include water displacing paints, flexible primer, crack arrestment compounds, powder metallurgy, aluminum alloys and substitutes for cadmium plating. Author

N82-17362# Systems Research Labs., Inc., Dayton, Ohio.

NEW CONCEPTS IN MULTIFUNCTIONAL CORROSION FOR AIRCRAFT AND OTHER SYSTEMS

M. Khobaib and F. W. Vahldiek *In* AGARD Aircraft Corrosion Aug. 1981 13 p refs

Avail: NTIS HC A09/MF A01

Multifunctional nonchromate inhibitors were developed for a Rinse Facility to reduce corrosion maintenance costs by removing corrosive contaminants from aircraft which operate in aggressive environments such as marine environments. These inhibitor systems are low cost, water soluble, nontoxic formulations which are effective against general corrosion, localized corrosion, and environmentally assisted crack growth under conditions of stress corrosion and corrosion fatigue. Extensive polarization, immersion, and galvanic-coupling experiments were conducted to determine effectiveness. A borax-nitrite-based inhibitor containing small additions of nitrate, silicate, phosphate, and mercaptobenzothiazole was found to provide excellent corrosion protection for high strength aluminum and steel alloys used in aerospace applications and for copper-bearing alloys used in electronic components and in parts of the Rinse Facility. Envionmental effects upon crack-growth rates of aluminum and high strength steel alloys were eliminated, reducing the rates in corrosion fatigue as compared to those obtained in air. A test program using these inhibitors is described. Tracking of maintenance costs and corrosion damage in being conducted to determine the effectiveness of the inhibited rinse in reducing corrosion costs. M.D.K.

N82-17363# Naval Air Development Center, Warminster, Pa.

CORROSION IN NAVAL AIRCRAFT ELECTRONIC SYSTEMS

Irving S. Shaffer *In* AGARD Aircraft Corrosion Aug. 1981 12 p refs

Avail: NTIS HC A09/MF A01

Naval aircraft electronic equipment suffer frequently from the effects of moisture and corrosion. The critical design features which have led to excessive susceptibility to these failure modes are described. Several examples are cited of inadequately protected equipment located in aircraft installations where they were subjected to repeated moisture intrusion during rainstorms, low level flights over water and high pressure fresh water washdowns. The specific deterioration effects that occurred on the various components that make up the avionic systems are presented. Maintenance data summaries are included to denote further the corrosion problem severity. Corrective measures in design, testing and maintenance are also discussed. Author

N82-17364# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

CORROSION PROTECTION SCHEMES FOR AIRCRAFT STRUCTURES: SOME EXAMPLES FOR THE CORROSION BEHAVIOUR OF Al ALLOYS

Henri Lajain *In* AGARD Aircraft Corrosion Aug. 1981 16 p

Avail: NTIS HC A09/MF A01

A summary of the main groups of aircraft surface protection procedures frequently applied is presented. In addition, some examples are given on the corrosive behavior of aluminum alloys. Information is also given on novel nondestructive test methods serving to recognize corrosion within the scope of aircraft maintenance. The following requirements which must be imposed with regard to the performance and quality of the surface protection are considered and discussed: (1) the potential differences of the materials used are to be kept as low as possible, i.e., constructive measures must be taken; (2) prevention of any local element activity by providing insulating protective coatings, i.e., by preventing a current; (3) inhibition by providing cover layers (e.g., chromate passivation); and (4) introducing layers which act as so-called sacrificial anodes. M.D.K.

N82-17377# Swedlow, Inc., Garden Grove, Calif.
TRANSPARENT POLYOLEFIN FILM ARMOR Final Report, 30 Mar. 1976 - 28 Feb. 1981
Ralph Shelton Watertown, Mass. AMMRC Aug. 1981 264 p refs
(Contract DAAG46-76-C-0034)
(AD-A107562; SI-ER-1001; AMMRC-TR-81-41) Avail: NTIS HC A12/MF A01 CSCL 19/4

The general objective of this project was to determine the optimum processing conditions for the large scale conversion, by molding and laminating of oriented polyolefin film into fragment resistant transparent armor suitable for Army aircraft glazing applications. The manufacturing process must produce a laminate with sufficient adhesion to resist debonding during thermal cycling and yet react as a laminar structure during ballistic impact. Author (GRA)

N82-17401# Chevron Research Co., Richmond, Calif.
REFINING AND UPGRADING OF SYNFUELS FROM COAL AND OIL SHALES BY ADVANCED CATALYTIC PROCESSES Interim Report
R. F. Sullivan, D. J. ORear, and H. A. Frumkin Sep. 1981 319 p refs
(Contracts DE-AC22-76ET-10532; EF-76-C-01-2315)
(DE82-001127; DOE/ET-10532/T3; FE-2315-61; IR-5) Avail: NTIS HC A14/MF A01

Two coal syncrudes derived from Illinois No. 6 and Wyodak coals were refined in a extensive program which included pilot plant and laboratory studies. These studies demonstrated that advanced, commercial petroleum technology can be used to refine these syncrudes to gasoline, jet, diesel and heating fuels. The coal syncrudes have a low hydrogen content, compared to petroleum, and high concentrations of oxygen and nitrogen impurities. These syncrudes are a blend of two coal distillates boiling between C sub 5 and 680 F. Consequently, they contain no residual and have about 95% boiling in the gasoline or diesel fuel ranges. With these properties, an appropriate way to refine the syncrudes is by hydroprocessing. Hydroprocessing yields a volume of finished products which is almost equivalent to the original volume of syncrude. In addition, the heteroatoms are ultimately removed as sulfur and salable ammonia. The engineering studies provided estimates of the refining costs. DOE

N82-17459# Open Univ., Milton (England). Energy Research Group.
EVALUATION OF THE DESIGN, CONSTRUCTION AND OPERATION OF A GAS FUELED ENGINE DRIVEN HEAT PUMP
C. A. Phillips Jan. 1981 76 p refs
(ERG-034) Avail: NTIS HC A05/MF A01

The design, construction, testing, and evaluation of a gas fueled engine driven heat pump are considered. The heat pump, using air as its source of heat is driven by a 360 cc single cylinder marine engine converted to run on natural gas. The unit was built, installed in a laboratory, and underwent intensive performance testing. The heat pump works well and justifies the design assumptions made, having allowed for a poor performance from the particular engine used. At 6 C (ambient) an output of 14 kW with an overall efficiency or C.O.P. (total heat output/gas input) of 1.1 was achieved. Results compare favorably with a seasonal efficiency of a gas boiler of around 0.65 to 0.70. J.M.S.

N82-17469# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany).
[SCIENTIFIC REPORT OF THE FLUID MECHANICS RESEARCH DEPARTMENT] Annual Report, 1980
1980 105 p refs
Avail: NTIS HC A06/MF A01

Research in theoretical and experimental fluid mechanics, propulsion technology, acoustics, and aerodynamic design is reported. Boundary layer flow, high speed train aerodynamics, cryogenic wind tunnels, compressors, helicopter interior noise, and aircraft design are among the topics described. Test facilities computational methods and experimental procedures are outlined. Author (ESA)

N82-17477# National Aerospace Lab., Tokyo (Japan).
A VELOCITY VECTOR MEASURING SYSTEM WITH 13 ASYMMETRIC WEDGE TYPE YAWMETERS
Teruomi Nakaya, Hideo Hoshio, and Masayoshi Noguchi Jun. 1981 20 p refs In JAPANESE; ENGLISH summary
(NAL-TR-674; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

In order to survey the flow field around the empennage of the NAL STOL research aircraft model in the 6m low speed wind tunnel, a velocity vector measuring system with 13 asymmetric wedge type yawmeters was developed. The rotational angle of the 13 probes and the setting angle of this system are automatically controlled following the sequence previously programmed into a minicomputer system. The hardware, control modes, data reduction, and data processing are described. The accuracy of the flow angle measurement turned out to be satisfactory, but measurements of dynamic pressure and static pressure were less accurate. An example of measurements taken of the flow field around the empennage of the STOL research aircraft model is included. A.R.H.

N82-17478*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
DEVELOPMENT OF A SIMPLE, SELF-CONTAINED FLIGHT TEST DATA ACQUISITION SYSTEM Progress Report
Ronald R. L. Renz Feb. 1981 208 p refs
(Grant NsG-4019)
(NASA-CR-168438; KU-FRL-407-6) Avail: NTIS HC A10/MF A01 CSCL 14B

A low cost flight test data acquisition system, applicable to general aviation airplanes, was developed which meets criteria for doing longitudinal and lateral stability analysis. Th package consists of (1) a microprocessor controller and data acquisition module; (2) a transducer module; and (3) a power supply module. The system is easy to install and occupies space in the cabin or baggage compartment of the airplane. All transducers are contained in these modules except the total pressure tube, static pressure air temperature transducer, and control position transducers. The NASA-developed MMLE program was placed on a microcomputer on which all data reduction is done. The flight testing program undertaken proved both the flight testing hardware and the data reduction method to be applicable to the current field of general aviation airplanes. A.R.H.

N82-17482# Spectron Development Labs., Inc., Costa Mesa, Calif.
DEVELOPMENT AND LABORATORY TESTING OF A THERMAL EMISSION VELOCIMETER FOR APPLICATION TO AN EROSION NOSE TIP TEST FACILITY Final Report, Jul. 1979 - Nov. 1980
James D. Trolinger and M. J. Houser Wright-Patterson AFB, Ohio AFWAL Aug. 1981 23 p refs
(Contracts F33615-76-C-3145; F33615-79-C-3030; AF Proj. 2404)
(AD-A107713; SDL-80-6526; AFWAL-TR-81-3080) Avail: NTIS HC A02/MF A01 CSCL 14/2

A thermal emission velocimeter concept was explored and a system was developed for use in measuring particle velocities up to 5,000 meters per second in a reentry erosion facility. The particles, ranging from 10 to 100 micrometers in diameter, are generated to study reentry nose tip erosion and ablation. The approach passively utilizes optical components of a laser transit anemometer coupled to a microprocessor data management system. The system was laboratory tested and has inherent characteristics which should produce quality data in the severe and noisy environment of a reentry test facility. The system sensitivity has been calculated to measure velocity of micrometer sized particles whose temperature are minimally 1700 K. Author (GRA)

N82-17483# Calspan Field Services, Inc., Arnold Air Force Station, Tenn.
A DURABLE, INTERMEDIATE TEMPERATURE, DIRECT READING HEAT FLUX TRANSDUCER FOR MEASUREMENTS IN CONTINUOUS WIND TUNNELS Final Report, 1 Oct. 1980 - 30 Jun. 1981
C. T. Kidd AEDC Nov. 1981 66 p refs
(AD-A107729; AEDC-TR-81-19) Avail: NTIS

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[NTSB-AAR-81-17] N82-17138
BIBLIOGRAPHIES
Fiscal year 1981 scientific and technical reports, articles, papers, and presentations
[NASA-TM-82445] N82-16927
BIOLOGY
An airline view of the corrosion problem
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BLADE TIPS
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[DGLR PAPER 81-103] A82-19272
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[AIAA PAPER 82-0173] A82-22060
Surveys of flow-field around empennage of the NAL STOL-research-aircraft model
[NAL-TR-677] N82-17124
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A real time Pegasus propulsion system model for VSTOL piloted simulation evaluation
[AIAA PAPER 81-2663] A82-19221
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Ground calibration of a strain-gauged C-141A aircraft (1979)
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Numerical and flight simulator test of the flight deterioration concept
[NASA-CR-3500] N82-16655
CANARD CONFIGURATIONS
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[AIAA PAPER 82-0180] A82-19784
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[AIAA PAPER 82-0097] A82-22046
High angle-of-attack characteristics of three-surface fighter aircraft --- canard-wing-horizontal tail configuration for greater stability and control
[AIAA PAPER 82-0245] A82-22074

CANS
Development of in-can melting process and equipment, 1979 and 1980
[DE82-001050] N82-16834

CARBON FIBER REINFORCED PLASTICS
The ultrasonic inspection of C.F.C. --- carbon fiber sine wave spars
[MDR-0465] N82-17513

CARET WINGS
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[NASA-CR-165813] N82-16070

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[DE82-001127] N82-17401

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[AD-A106670] N82-16085

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[DGLR PAPER 81-094] A82-19271
The Boeing Flight Test Data System 1980
A82-20769
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[RTCA/DO-178] N82-16759

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[AD-A107842] N82-17085
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N82-17120

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A82-18898
Airport radar systems --- Russian book
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[AIAA PAPER 81-2655] A82-19220
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[DGLR PAPER 81-093] A82-19268
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A82-20514
The FS2 RAE Bedford civil flight research programme --- on components and system integration for optimum ATC
A82-20519
Experience and needs of civil and military flight simulator users; Proceedings of the Flight Simulation Symposium, London, England, April 7, 8, 1981
A82-20526
Advanced simulation --- in commercial aviation
A82-20535
An independent view of where civil simulation should be headed --- training simulators for civil aircraft
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Gateway diversity and competition in international air transportation
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[AIAA PAPER 82-0013] A82-22027
Symposium on commercial-aviation energy-conservation strategies
[DE81-028406] N82-16057
Assessment of historical and projected segments of US and World civil and military rotorcraft markets 1960 - 1990
[NASA-CR-166151] N82-17137
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[DE82-001127] N82-17401

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[DE82-001127] N82-17401

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[DGLR PAPER 81-101] A82-19270
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[AIAA PAPER 82-0261] A82-22079

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[NASA-TM-81341] N82-16076

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[NAL-TR-677] N82-17124

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  Active beacon collision avoidance logic evaluation. Volume 2: Collision avoidance (BCAS) threat phase [AD-A107805] N82-17148
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  Spectrally balanced chromatic landing approach lighting system [NASA-CASE-ARC-10990-1] N82-16059
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  Application of image processing techniques to fluid flow data analysis [NASA-TM-82760] N82-16049
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  Fuel property effects on radiation intensities in a gas turbine combustor A82-19966
  Dilution jet behavior in the turn section of a reverse flow combustor [AIAA PAPER 82-0192] A82-20291
COMBUSTION PRODUCTS
  The sooting tendency of fuels containing polycyclic aromatics in a research combustor [AIAA PAPER 82-0299] A82-19791
  Fuel property effects on radiation intensities in a gas turbine combustor A82-19966
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  Use of optimization to predict the effect of selected parameters on commuter aircraft performance [NASA-CR-168439] N82-17151
  Aircraft Corrosion [AGARD-CP-315] N82-17349
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  Engine/drive/airframe compatibility: A way of life N82-17220
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  Gateway diversity and competition in international air transportation A82-21474
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  Aircraft alerting systems standardization study. Volume 2: Aircraft alerting system design guidelines [AD-A106732] N82-16077
  Research and development program for non-linear structural modeling with advanced time-temperature dependent constitutive relationships [NASA-CR-165533] N82-16080
  Corrosion control test method for avionic components [AD-A108061] N82-17171
  Component research for future propulsion systems N82-17224
COMPOSITE MATERIALS
  Pactec V - Plastics technology advances/1980 update; Proceedings of the Fifth Annual Pacific Technical Conference, Los Angeles, CA, February 26-28, 1980. Volume 3 A82-20521
  Environmental exposure effects on composite materials for commercial aircraft [NASA-CR-3502] N82-16178
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  Technical evaluation report of the AGARD Fluid Dynamics Panel Symposium on computation of viscous-inviscid interactions [ONERA, TP NO. 1981-116] A82-19733
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  Numerical solution of three-dimensional unsteady transonic flow over wings including inviscid/viscous interactions [AIAA PAPER 82-0352] A82-19797
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  A perspective of computational aerodynamics from the viewpoint of airplane design applications [AIAA PAPER 82-0018] A82-22028
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  Isolated nacelle performance - Measurement and simulation [AIAA PAPER 82-0134] A82-22054
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  Steady and unsteady nonlinear hybrid vortex method for lifting surfaces at large angles of attack [AIAA PAPER 82-0351] A82-22094
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Real gas flows over complex geometries at moderate angles of attack
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Analytical prediction of aerospace vehicle vibration environments
[ASME PAPER 81-DET-29] A82-19305
Flight testing in the eighties; Proceedings of the Eleventh Annual Symposium, Atlanta, GA, August 27-29, 1980
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General aviation fuel conservation in the 1980's
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Determining performance parameters of general aviation aircraft
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A82-20656
Institute of Navigation, Annual Meeting, 36th, U.S. Naval Postgraduate School, Monterey, CA, June 23-26, 1980, Proceedings
A82-21586
Calibrated and uncalibrated inertial navigation system performance in valid and jammed global positioning system environments
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The Global Positioning System Evaluator --- facility for testing in simulated wide range environments
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A perspective on civil use of GPS
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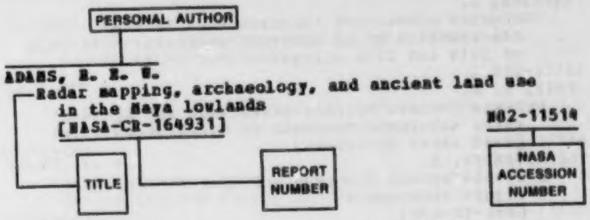

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Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 359-368.

Selection criteria for the pressing processes in manufacturing stretched acrylic from as-cast billets at the Lucas facility are discussed. Advantages of a press over gripping around the edges include more parallel surfaces, better yield from the material, and the avoidance of sheet splitting which sometimes occurs when the material is stretched. Specifications for stretched acrylic are discussed, and the facility is described, including a discussion of the stretching press and the grinding/polishing machines. The planned expansion of the facility is also discussed, which includes the introduction of a pre-heater and additional polishing machines. D.L.G.

A82-24319 **Problems associated with the quality assurance of stretched acrylic sheet.** R. L. Worsdall (Ministry of Defence /Procurement Executive/, Material Quality Assurance Directorate, London, England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 371-397.

A description is presented of special problems arising in connection with an application of a manufacturer for Type Approval of a material intended for defense-related uses, taking into account the approaches employed to solve these problems. The material involved was stretched acrylic sheet. There were differences between test results obtained in the laboratories of the manufacturer and the Materials Quality Assurance Directorate. The differences were, in particular, observed in thermal relaxation studies, and increased as the thickness of the sheets examined became progressively larger. In an investigation of the reasons for these differences, it was found that in the conduction of thermal relaxation studies the temperature control is important and the moisture content is critical. An important factor is also the position from which the sample is taken in the sheet. G.R.

A82-24320 **The effects of absorbed moisture upon the physical properties of stretched acrylic materials.** A. J. Mason (British Aerospace Public, Ltd., Co., Materials Laboratory, Weybridge, Surrey, England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 399-416. Research supported by the Ministry of Defence (Procurement Executive).

It is noted that stretched acrylic materials are often preferred to 'as-cast' acrylics for the manufacture of aircraft transparencies owing to their superior craze and crack propagation resistance. However, the service performance of stretched acrylics can be affected by their operational environment. The effects of absorbed moisture upon various physical properties of stretched acrylic materials, including thermal relaxation, surface shrinkback, solvent craze resistance, crack propagation resistance, and surface hardness, are described. It is pointed out that the base stock material and method of stretching may also influence physical properties. These have been assessed by including in the evaluation three materials that have been manufactured from two base stock materials and produced by two manufacturing techniques. C.R.

A82-24323 **The development of high strength light-weight windshields for the new generation of Boeing 757 and 767 airliners.** R. W. Wright (Triplex Safety Glass Co., Ltd., Aircraft and Special Products Div., Birmingham, England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 533-548.

Windshields based on multilaminate construction and electroconductive coatings were introduced in the 1970s on such aircraft as the Concorde, A300B, de Havilland Canada Dash 7, and Boeing 747. In all, more than 20,000 hours of flight have been recorded. The way in which this technology is being adapted to meet the needs of the new Boeing 757 and 767 aircraft, where weight saving and reliability are fundamental requirements, is discussed. A description is also given of design, development and qualification test features. C.R.

A82-24324 **D.C.9 windshield - Effect of attachment retorque.** J. Christensen (Scandinavian Airlines System, Copenhagen, Denmark). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 549-562.

Reference is made to a paper by Christensen (1978) propounding a theory related to the influence of attachment method on failures for D.C. 8-60 and D.C.9 winshields. The experience of regular retorquing of attachment fasteners on Scandinavian Airlines System aircraft is reported. It is noted that this has had a marked effect on reducing windshield failures. Further expected improvements are discussed. C.R.

A82-24325 **B.A.C. One-Eleven flight deck glazing product improvement.** J. F. Russell (British Aerospace Public, Ltd., Co., Weybridge, Surrey, England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p.563-576.

The modifications described include recessed bus-bars, fiberglass chip retarders, and the introduction of additional interlayer plies of a new material, all for the windshield. Another modification involved moving the de-mist film on the side windows from one glass ply to another. It is noted that, altogether, these modifications have led to a doubling of the windshield MTBF in eight years and to a great improvement in the side windows. C.R.

A82-24326 **Concorde glazings - 5 years of Mach 2 service.** W. P. C. Soper and R. A. Brown (British Aerospace Public, Ltd., Co., Bristol, England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 577-601.

A description is provided of the level of achievement obtained with respect to the transparencies of the Concorde project. Aircraft operating conditions are considered. It is pointed out that the transparency configuration was conceived such that the aircraft would key into the normal operating pattern of conventional jet transport traffic and that no preferential treatment would be needed. The visor panels of the aircraft are discussed, taking into account the current visor panel construction, aspects of cyclic testing, flight testing, alternative panel designs, and in-service performance. Attention is also given to the forward main windscreen, the D.V. and aft side windows, and the Series aircraft cabin window. G.R.

A82-24338 # **Air transportation of handicapped persons (Le transport aérien des handicapés).** E. Mapelli (Iberia Lineas Aéreas de España, Madrid, Spain). In: Annals of air and space law. Volume 5. Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1980, p. 171-188. 16 refs. In French.

Various legal aspects of the air transportation of handicapped persons are reviewed. Consideration is given to the rights and obligations of passengers as they pertain to the handicapped, the physical ability of passengers to travel on aircraft and the right of carriers to exclude the handicapped, obligations of the carrier in relation to the handicapped passenger, and carrier liability in relation to the injury of a handicapped passenger. B.J.

A82-24354 **The coupling of electromagnetic interference into aircraft systems.** R. V. Pankhurst (Aeroplane and Armament Experimental Establishment, Boscombe Down, Wilts., England). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 117-128.

Results of tests performed to determine the electromagnetic transfer function for complete aircraft from 100 kHz to 250 MHz are presented. The current distribution within the wiring bundle is shown along with the effect of end terminations, and attention is given to the variability between aircraft of the same type and aircraft of different types. Also considered are the developing overall picture of these induced currents and the implications of these results for future clearance work as well as for the usefulness of this information to aircraft systems and equipment designers. B.J.

A82-24355 **The variation of induced currents in aircraft wiring.** P. M. Newton (Ministry of Defence /Procurement Executive/, London, England). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 129-134.

The paper examines the use of the bulk current method to measure the variation of induced currents in aircraft wiring due to the operation of onboard transmitters and the variation of the RF environment. The measurement method is described and typical results of aircraft samples to date are discussed. Results to date have shown that current varies by a factor of three and the RF environment on the average by a factor of two. B.J.

A82-24357 **MIL-STD 1553B - Aircraft EM environmental susceptibility effects.** G. Gerbi and E. R. Totto (Aeritalia S.p.A., Turin, Italy). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 147-155.

The subject of this paper is the technology applied to aircraft to minimize EMI in the installation of MIL-STD-1553B digital transmission links. The electromagnetic interference generators normally installed on aircraft are considered, and the susceptibility of a typical MIL-STD-1553B data link is investigated. Experimental tests and computer aided analysis using the SEMCAP program, which have been performed for simple geometrical coupling models, are described. The results of this work give practical indications about the influence of mechanical and electrical harness parameters on EMC aspects of the aircraft installation of MIL-STD-1553B digital transmission lines. A good architecture for digital data link installations is also discussed. (Author)

A82-24358 **Materials aspects of aircraft EMC design.** M. W. Baskerville and J. Brettle (Plessey Research /Caswell/, Ltd., Allen Clark Research Centre, Towcester, Northants., England). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 157-170. Research supported by the Ministry of Defence (Procurement Executive).

The effect of materials, construction methods, and corrosion protection schemes on the dc and RF impedance of structural and electrical joints in aircraft is considered. The development of the theory and practice of making resistance measurements in large structures is examined in the light of a survey of bond resistance measurements in service aircraft. It is shown that the resistance of structural and electrical bonds in aircraft is critically dependent on a number of variables, including the type of fastener used, materials, and conditions of the relevant surfaces. It is possible to choose a set of variables which give a low bond resistance which is constant with time even when exposed to corrosion conditions. B.J.

A82-24359 **EMC clearance of modern military aircraft.** I. P. Macdiarmid and D. M. Wormstone (British Aerospace Public, Ltd., Co., Military Aircraft Div., Warton, Lancs., England). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 171-182. Research supported by the British Aerospace Public, Ltd., Co.

An approach to EMC testing which was recently adopted on a production version of a modern strike aircraft is described. The procedure involved: a quantitative assessment of the switching transients occurring on bus bars and selected signal lines; an interaction test whereby each potentially susceptible system must be observed while other systems are operated in their most emissive modes; a study of the safety margin of the compatibility of aircraft systems with intentional onboard transmitters; an investigation of the compatibility of the aircraft systems with the external RF environment; a quantitative assessment of the extent of data corruption at transducer-computer interfaces due to onboard emissive sources; and an in-depth compatibility study of all onboard RF equipment. The methods used and the results obtained were considered adequate to provide an assessment of the EMC of the onboard systems; however, it is noted that the demonstration of compatibility could be improved in certain areas. B.J.

A82-24361 **The testing of aircraft under near field conditions.** M. Elliott (Aeroplane and Armament Experimental Establishment, Boscombe Down, Wilts., England). In: Conference on Electromagnetic Compatibility, Southampton, England, September 16-18, 1980, Proceedings. London, Institution of Electronic and Radio Engineers, 1980, p. 199-206.

Although the HF band is of considerable interest in external field EMC testing, the environment in a typical trials facility is highly complex in this frequency range. This is due to operation in the near field region of the transmitting antenna, the proximity of the ground, and the presence of the fields scattered by the object under test. This problem was investigated by comparing the surface currents induced by three near field sources and one far field source on a cylinder which modeled the aircraft. The effects of the orientation of the cylinder on the measured magnetic and electric components of the field are examined, and optimum positions and methods of field measurements are discussed. B.J.

A82-24371 **Managing computer aided design; Proceedings of the Conference, London, England, November 19, 1980.** Conference sponsored by Institution of Mechanical Engineers. London, Mechanical Engineering Publications, Ltd. (I Mech E Conference Publications 1980-8), 1980. 51 p. $30.

Papers are presented on the problems encountered by the incorporation of computer-aided design and computer-aided manufacturing (CAD/CAM) systems into the process industries, such as aircraft manufacture and chemical production, in Britain. Attention is given to the use of CAD graphics by a mechanical engineering firm, the successful management of CAD, the use of CAD/CAM electronic data transfer to integrate geographically distributed aircraft production, experience with computer-aided building design system in an architectural firm, the acceptance of interactive graphics by industry, and the relation between the financial productivity impact of CAD/CAM and labor relations. O.C.

A82-24373 **CAD/CAM in British Aerospace - Aircraft Group.** J. S. Rawlins (British Aerospace Public, Ltd., Co., Aircraft Group, Kingston-on-Thames, Surrey, England). In: Managing computer aided design; Proceedings of the Conference, London, England, November 19, 1980. London, Mechanical Engineering Publications, Ltd., 1980, p. 27-34.

The use of computer-aided design and computer-aided manufacturing (CAD/CAM) techniques in aspects of aircraft structure geometry and electrical system definition is described for the case of the BAe 146 commuter aircraft. The use of electronic design and production data transfer is especially important in aircraft industry projects of the kind described because of the geographical distribution of component fabrication and assembly facilities. Emphasis is put on the ability of a CAD/CAM system to make information promptly available, from the conceptual design to the in-service product support stages, without need for manual transcription before distribution. O.C.

A82-24376 **Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981.** Congress sponsored by the Society of Automotive Engineers. Warrendale, PA, Society of Automotive Engineers, Inc., 1981. 90 p. $18.
(SAE SP-500)

The design, testing, maintenance, requirements, and future needs for aircraft power supplies were covered. Specific attention was given to design considerations of DC-Link aircraft generator systems and to cost of ownership advantages such as weight reduction and maintainability with a shared-oil system. Considerations for the design of variable speed, constant frequency (VSCF) generators are presented, and advanced generating systems technology was discussed. The effect of critical design parameters on the selection of a VSCF system was examined, along with the evolution and development of high voltage (270 V), dc aircraft electric systems and packaging the VSCF system for a military aircraft environment. Finally, the development of an aircraft electric system test facility was detailed. M.S.K.

A82-24377 **Design considerations of DC-Link aircraft generation systems.** M. A. Rosswurm (Westinghouse Electric Corp.,

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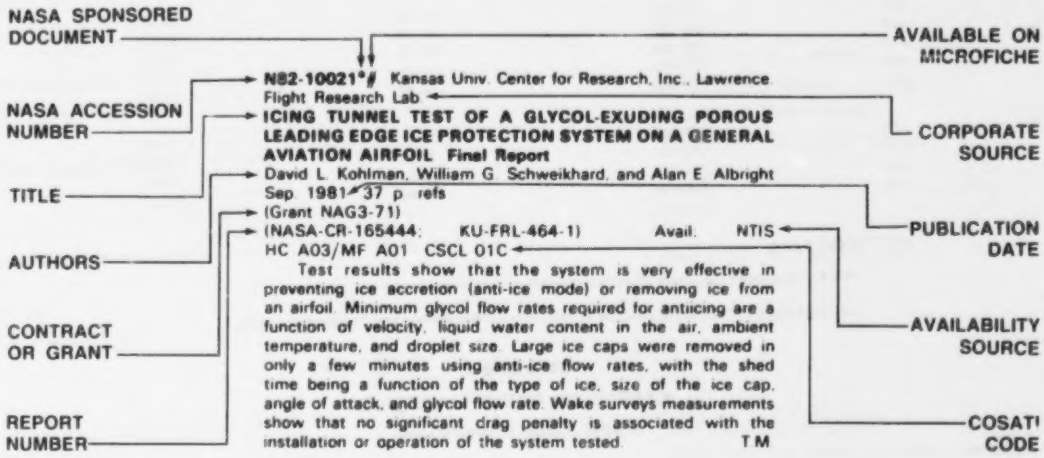

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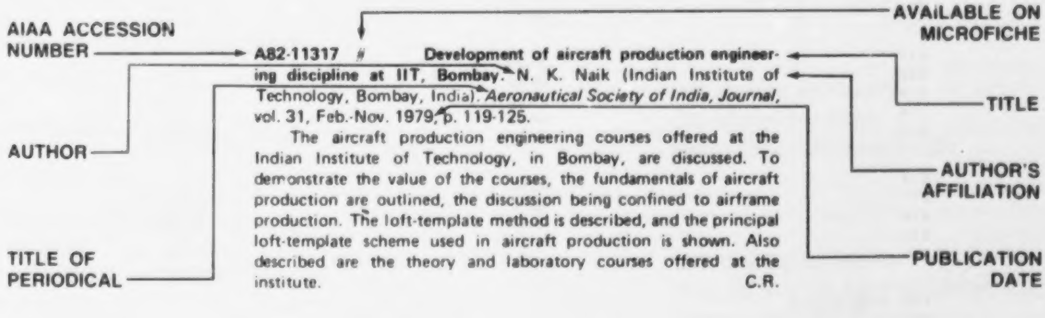
N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

TYPICAL CITATION AND ABSTRACT FROM *IAA*



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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 149)

JUNE 1982

IAA ENTRIES

A82-22398 † Analysis and optimization of control systems in piloted flight vehicles (Analiz i optimizatsiia sistem upravleniia pilotiruemykh letatel'nykh apparatov). G. I. Ryl'skii. Moscow, Izdatel'stvo Mashinostroenie, 1981. 200 p. 156 refs. In Russian.

An analysis is given of the activity of a human operator in the control systems of piloted flight vehicles and of the possibility of describing this activity mathematically. A classification is suggested, and an analysis made, of recent mathematical models describing human activity in these systems. Attention is given to the advantages of the models that use queuing theory, and these models are used in elaborating techniques for determining characteristics of the operator's work. C.R.

A82-22407 † Utilization of radio equipment at airports and on airways (Ekspluatatsiia radiooborudovaniia aerodromov i trass). A. A. Kuznetsov and V. I. Dubrovskii. Moscow, Izdatel'stvo Transport, 1981. 224 p. 26 refs. In Russian.

The organization of navigation aids and air traffic control in civil aviation is briefly considered. Problems of technical and economic planning, the organization of support and maintenance, and the collection and processing of reliability data pertaining to air navigation and ATC equipment are also considered. Specific attention is given to the utilization characteristics of radio navigation and ATC systems; ATC radar stations; automated ATC; display equipment; and methods and models for the utilization of radio navigation and ATC systems. B.J.

A82-22880 Complete guide to Rutan homebuilt aircraft. D. Downie and J. Downie. Blue Ridge Summit, PA, Tab Books, Inc., 1981. 288 p. $8.95.

The development history of a group of home-built sport aircraft characterized by canard configurations and non-metallic construction is presented, from the time that the designer, Burt Rutan, who won an AIAA award for his thesis on roll-yaw coupling started the project to the flight testing of the four-passenger, push/pull propeller Defiant aircraft. Incorporating the canard in order to exploit both its inherent stall-limiting function and its direct-lift generation at low incidence during short takeoffs and landings, the two designs featured are (1) the plywood-structure VariViggen, and (2) the more highly developed VariEze/Long-EZ, whose structure is of fiberglass cloth-reinforced self-curing epoxy layups over pre-shaped styrofoam. Additional material on aircraft construction and performance at the hands of the designer and dozens of his hobbyist-clients is also presented. O.C.

A82-22881 Computer-generated images for simulators - The cost of technology. G. C. Larson. *Air Force Magazine*, vol. 65, Feb. 1982, p. 54-59.

The effectiveness, capabilities, and prospects for computer-controlled flight simulators suitable for combat flight training are examined. Current devices offer a wraparound imagery, multiple crewmember interface, and separate cockpit coordinated displays suitable for developing teamwork among pilots of different aircraft. The simulators are equipped with realistic cockpits, an instructor's station with full control and recording equipment, a data base with simulator dynamics and ability to translate actions into real-time responses, and a visual system which displays a scene that could be expected in the real world. Mechanical limitations are defined by the cost of memory and processing speed necessary for edge generation, the formation of geometric shapes and solids closely resembling real world objects, and texturing has shown promise for defining recognizable areas by rectangular areas which overlap in a fashion acceptable to a human field of vision. M.S.K.

A82-22896 # Lineup of the IM-series aircraft-derivative gas turbines. K. Takeo (Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan). *IHI Engineering Review*, vol. 14, Oct. 1981, p. 36-42. 5 refs.

The development of the IM-series of aircraft derivative gas turbines is reviewed. The discussion begins with the IM1500 GL engine, having an output at turbine coupling of 11,100 kW and a thermal efficiency of 26.8%, first used as an industrial gas generator in 1968. Principal characteristics of the IM2000 and IM2500 are then discussed: the output and thermal efficiency of these two models are given as 12,800 kW and 33.5% and 19,300 kW and 35.1%, respectively. Fundamental specifications of the power turbines are described, and the flowpath design is presented. The construction and mechanical design of the engins are described, and results of creep-rupture, high temperature fatigue, and vibratory stress tests are given. Finally, the IM5000 power turbine, with an output of 38,000 kW and an efficiency of 38.4% is described. It is also shown how heat in the high-temperature exhaust gases from the turbines can be used in waste heat recovery systems to improve the total plant efficiency. J.F.

A82-22898 # History of the sweptback wing (Geschichte des Pfeilflügels). H. Ludwieg (Aerodynamische Versuchsanstalt, Institut für experimentelle Strömungsmechanik, Göttingen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Jahrestagung, Aachen, West Germany, May 11-14, 1981, Paper 81-070.* 15 p. 10 refs. In German.

The history of sweptback wings which make use of the sweepback to alter the effective Mach number is reviewed. Principles of the sweptback wing and its effects are discussed for subsonic flight with high Mach numbers, supersonic flight with a subsonic leading edge, and supersonic flight with a supersonic leading edge. The historical development is traced from the first sweptback wing model in 1939 for the Gottinger high speed wind tunnel to various fighter aircraft including the Messerschmitt 262 and Heinkel designs. Results of wind tunnel tests for various angles of sweepback are presented. D.L.G.

A82-22902 The use of dynamic mock-ups in the design of advanced systems. M. L. Gravely (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and L. Hitchcock (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Human Factors Society, Annual Meeting, 24th, Los Angeles, CA, October 13-17, 1980, Proceedings. Santa Monica, CA, Human Factors Society, Inc., 1980, p. 5-6.

The advantages of using dynamic mock-ups in advanced system design are discussed in terms of the USAF's Digital Avionic Information System (DAIS) Program and the Navy's Advanced Integrated Display System (AIDS) Cockpit Development Program. Experienced pilots are employed to judge the acceptability of slide projector displays for radar, low-light level television, and alphanumeric and vector graphic formats. Cost effectiveness is achieved by lowering software costs, minimizing time in constructing the mock-up, and high reliability-low maintenance features. The cockpit layout is set up once the required tasks and the number of multifunction

Aerospace Electrical Div., Lima, OH). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p.1-15.

Design considerations in the development of the DC-Link VSCF electrical power systems for aircraft are presented, along with component descriptions, functional details, applications to the AV8-B and F-5G, and comparisons to alternate methods of power generation. The DC-Link system is compared with constant speed drive and cycloconverter energy systems, and the major components of the DC-Link system are shown to be a generator module, power electronics module, and the generator control module, which as a system yield a constant frequency output and employ transistorized switching. Specific descriptions are provided of the power transistors, the inverter power pole, the commutating diodes, and the base drive circuit. Operational characteristics such as the inverter waveform, neutral forming transformer and power stage sensing are considered, and functions of the generator control unit and inverter drive logic module are outlined. M.S.K.

A82-24378 Cost of ownership advantages with a shared oil system. R. C. VanNocker and W. A. Carmine (General Electric Co., Binghamton, NY). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p.17-21.

The benefits and system features of coupling the aircraft gearbox oil to the generator cooling system are outlined. It is noted that in a constant speed drive system, weight, maintainability, and life cycle costs are aided by avoiding redundant oil pumping facilities. The shared system is favored when generator functions won't contaminate the oil, pose no risk to the gearbox, and do not command the use of excessive amounts of oil. A dry cavity concept is described, which features heat exchangers completely isolated from any generator electrical components, and the use of the shared system on the F/A-18 is mentioned. The addition of the shared-oil module alters the maintenance concept from on-condition to a scheduled maintenance procedure, and an ultimate repair and maintenance cost figure of $2.70 per flight hr is derived. M.S.K.

A82-24379 High speed VSCF generator design consideration. T. L. Ho (Westinghouse Electric Corp., Aerospace Electrical Div., Lima, OH). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 23-33.

The employment of computer aided design (CAD) for VSCF generator design is examined, specifically with regard to thermal, stress, and dynamic analyses. Thermal analysis is accomplished through an iteration of a series of design modifications, and examples are presented for the design of inverter semiconductor stacks, a diode rectifier assembly, and a power pole assembly. Finite element programs are implemented in a structural analysis, focusing attention on weight reduction and stress concentration at specified speeds, and procedures are outlined for applications to an inverter cover plate and to a high speed rotor. Dynamic study comprises model analysis by a finite element method and a critical speed analysis of the rotating system by means of turbomachine dynamics programs, serving to define the structural stability of the system. M.S.K.

A82-24380 Advanced generating system technology. R. J. Kennett (Lucas Aerospace, Ltd., Electrical Div., Hemel Hempstead, Herts., England). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 35-41. Research supported by the Ministry of Defence (Procurement Executive) and Department of Industry.

A design approach to the achievement of a maximum specific output of an aircraft 400 Hz ac 2-pole generator with operation at 24,000 rpm is presented. Locating the field assembly inside a nonmagnetic shaft eliminated mechanical conflicts and allowed an inherently stiff rotor, permitted flooding the rectifiers with cooling oil to reduce temperature gradients, and porting to the stator to minimize drag losses and avoid insulation erosion. The rectifiers were moved toward the shaft axis, and interconnection with the main exciter was arranged to neutralize centrifugal forces on the rectifier connection. The rotor shaft is used to provide maximum support for the stressed elements along the length of the alternator, which has a single coil. Weight reduction is also provided over four-pole machines, and bearing life is protected by a low rotating mass and elimination of mechanical unbalance. Operation and maintenance are reviewed. M.S.K.

A82-24381 The effect of critical design parameters on the selection of a VSCF system. D. S. Yorksie and W. E. Hyvarinen (Westinghouse Electric Corp., Aerospace Electrical Div., Lima, OH). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 43-50.

A decision model of the critical design criteria for applications of either cycloconverter or DC-Link variable speed, constant frequency (VSCF) electric power generators onboard aircraft are examined. Power switching and controlling techniques and components are described for each type of generator, noting the advent of advanced high-power switching transistors. Critical parameters of choice include the system rating, cooling method and temperature, efficiency, weight, location, and gearbox speed and range. Each parameter is explored for effect in different applications, and it is concluded that rating, cooling temperature, efficiency, and weight are the most critical parameters. A fifth element is added to the four most critical criteria, and comprises system-specific features which customize the decision model to the application under consideration. M.S.K.

A82-24382 Evolution and development of high voltage /270 volt/ dc aircraft electric systems in the United States. J. D. Segrest (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA) and W. W. Cloud (Lockheed-California Co., Burbank, CA). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 51-63. 10 refs.

The system concept of high voltage dc power systems for aircraft applications is reviewed, with regard to the state-of-the-art in the hardware available. The history of dc system use is outlined, noting the continually increasing demand of higher voltage levels. Mention is also made of the inherent unsatisfactory lifetime levels of current constant speed 400 Hz power devices with respect to future aircraft. Cycloconverter and DC-Link power generating systems are subject to complex designs and display a poor power factor, wave form distortion, and EM incompatibility. Brushless dc motors are available for engine mounting, and provide 270 V dc, which offers high reliability, high efficiency, light weight, power continuity, fuel economy, and personnel safety. Existing systems and advanced systems are outlined, with operational performance and requirements, including the need to develop solid-state load controllers for over 50 amps power load. M.S.K.

A82-24383 Packaging the VSCF system for an aircraft engine environment. D. D. Pollard and G. E. Krajci (Westinghouse Electric Corp., Aerospace Electrical Div., Lima, OH). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981. Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p. 65-76.

The integration of microprocessor modules, high power semiconductor arrays, and a high-speed generator to form a compact, low-weight variable speed constant frequency (VSCF) power system is described. With specific consideration of military systems, envelope concerns are defined as the allowable space and shape, power and logic electrical interfaces, coolant/lubricant lines and interfaces, and maintainability. Military aircraft are noted to require dense packaging, have common disconnect mechanisms, and allow removal of the entire system at once. Sensitive components are sealed off from the environment and vibrations, and thermal control is provided by air oil and fuel-oil heat exchangers. Operation without oil flow is feasible for short periods of time due to the thermal inertia, and installations in the F-5G and AV-8B aircraft are detailed. M.S.K.

A82-24384 **Aircraft electric system development and test facilities.** D. Cousins (Sundstrand Corp., Rockford, IL). In: Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981.
Warrendale, PA, Society of Automotive Engineers, Inc., 1981, p.77-86.

Specialized capabilities, requirements, and design considerations for a facility to construct electric power systems for aircraft are described. A test area is provided for development and qualification testing of aircraft generating systems, along with a multistand complex for accelerated life testing, and a facility for electronic and electric products. Individual test cells are required for examining the performance of test generators during specified voltage drops and impedance. Further provision is made for testing prime movers, gearboxes, generator feeders, control consoles, load systems, and main and auxiliary load controls. Instrumentation is dedicated to both test stand consoles and from multichannel data acquisition system recorders and displays. Finally, electromagnetic compatibility testing is accomplished by examining radiated and conducted EM interference and by exposure to EM pulses. M.S.K.

A82-24385 **Wind and temperature database for flight planning.** H. C. True and D. E. Winer (FAA, Office of Environment and Energy, Washington, DC). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811068.* 8 p. 17 refs.

The importance of timely and accurate wind and temperature data to flight planning and aircraft fuel conservation is pointed out. Recent advances in meteorological data measurement make it possible to obtain the required information. Attention is given to aspects of flight planning, the existing observation network, an atmospheric model, fuel considerations, wind and temperature observation technology, the potential of satellite based wind observation systems, and the dissemination of observations to aviation flight planners. It is found to be technically and economically feasible to create a wind and temperature database for flight planning based on the Prototype Regional Observation and Forecasting System 'profiler'. G.R.

A82-24386 * **Airline flight planning - The weather connection.** R. Steinberg (NASA, Lewis Research Center, Cleveland, OH). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811067.* 12 p.

The history of airline flight planning is briefly reviewed. Over half a century ago, when scheduled airline services began, weather data were almost nonexistent. By the early 1950's a reliable synoptic network provided upper air reports. The next 15 years saw a rapid growth in commercial aviation, and airlines introduced computer techniques to flight planning. The 1970's saw the development of weather satellites. The current state of flight planning activities is analyzed. It is found that accurate flight planning will require meteorological information on a finer scale than can be provided by a synoptic forecast. Opportunities for a new approach are examined, giving attention to the available options, a mesoscale numerical weather prediction model, limited area fine mesh models, man-computer interactive display systems, the use of interactive techniques with the present upper air data base, and the implementation of interactive techniques. G.R.

A82-24387 * **Integration of energy management concepts into the flight deck.** S. A. Morello (NASA, Washington, DC). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811066.* 10 p. 7 refs.

The rapid rise of fuel costs has become a major concern of the commercial aviation industry, and it has become mandatory to seek means by which to conserve fuel. A research program was initiated in 1979 to investigate the integration of fuel-conservative energy/flight management computations and information into today's and tomorrow's flight deck. One completed effort within this program has been the development and flight testing of a fuel-efficient, time-based metering descent algorithm in a research cockpit environment. Research flights have demonstrated that time guidance and control in the cockpit was acceptable to both pilots and ATC controllers. Proper descent planning and energy management can save fuel for the individual aircraft as well as the fleet by helping to maintain a regularized flow into the terminal area. G.R.

A82-24388 **Application of damage tolerance technology to type certification.** T. Swift (FAA, Washington, DC). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811062.* 20 p. 29 refs.

An attempt is made to clarify some of the questions related to the FAA philosophy which are currently being raised by manufacturers in attempting to comply with recently amended regulations for aircraft structures. A description is presented of opinions related to good damage tolerance design practice, and fracture analysis methodology. In general, an evaluation of the structure, under typical load and environmental spectra must show that catastrophic failure due to fatigue, corrosion, or accidental damage will be avoided throughout the operational life of the aircraft. Attention is given to a damage tolerance evaluation, aircraft utilization, the selection of critical elements, aspects of stress spectra development, environmental effects, and fracture toughness data. G.R.

A82-24389 **Certification of civil composite aircraft structure.** J. R. Soderquist (FAA, Office of Airworthiness, Washington, DC). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811061.* 10 p. 19 refs.

The certification of composite civil aircraft structures is shown to require a common, allowable material property data base in which the chemical characterization of the resin through the use of high pressure liquid chromatography and Fourier transform infrared spectroscopy is employed. In addition, improved damage-tolerance techniques and tougher material systems must be developed to allow higher design strain levels. Significant benefits can be derived from the continued operation of a composite structure in the post-buckled regime, provided that investigations continue into environmental effects, combined loading states, curvature, variations in skin thickness and impact damage effects. It is recommended that a portable nondestructive inspection technique be devised for use in field repairs. O.C.

A82-24392 **Design technology for improved performance retention in turbofan engines.** D. L. Seiwert (General Electric Co., Fairfield, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811055.* 10 p.

General causes of performance loss in large turbofan engines after long time field use are examined, and programs whose objectives are to maximize engine performance retention are described. Advanced design concepts to produce significant improvement in performance retention of commercial turbofan engines are presented, and factors which cause clearance changes between rotating and static components are discussed. Engine generated and externally applied loads, and operating technique effects are addressed, and evaluation techniques for design verification including laser optics are described. Performance retention items include a substantially improved high pressure turbine shroud material, which reduces distortion and thereby avoids rubs. D.L.G.

A82-24393 **RB 211 powerplant deterioration - Review of current situation and lessons learned.** A. G. Collins (Rolls-Royce, Ltd., London, England). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811053.* 6 p.

The factors which cause aircraft engines to lose performance in a service environment are briefly examined. It is pointed out that in the case of the RB 211 engine many of the fundamental causes of deterioration are avoided or minimized in connection with basic engine design features. The -22B was the first of the RB 211 family of engines to enter service. Major causes of RB 211-22B deterioration were related to the accumulation of dirt on compressors, the distortion of HP NGV support rings, increased leakages in powerplant area, and erosion of turbine tip sealing segments. By suitable modifications of the engine design it was possible to eliminate the observed causes of engine deterioration in the RB211-524. Problems concerning engine deterioration observed in connection with RB 211-524 operation will be corrected in the RB 211-535 by the introduction of appropriate improvements. G.R.

A82-24394 **Management of powerplant maintenance and restoration programs for fuel conservation.** C. Reid (General Electric

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controls are known, and variations on the instrumentation set-up are tested repeatedly. The AIDS concept allows remote location of a slide projector for closed circuit television display of various instrument configurations in different situations, and selected displays are chosen for full scale simulation. M.S.K.

A82-22905 **Combined multisensor displays.** A. J. Josefowitz, R. A. North (Honeywell Systems and Research Center, Minneapolis, MN), and J. Trimble (U.S. Navy, Office of Naval Research, Arlington, VA). In: Human Factors Society, Annual Meeting, 24th, Los Angeles, CA, October 13-17, 1980, Proceedings. Santa Monica, CA, Human Factors Society, Inc., 1980, p. 17-21. Contract No. N00014-77-C-0684.

The use of combined multisensor displays which result from preprocessing of various sensor data for shape coding in a display is discussed in terms of lowering the pilot's workload. A Forward Looking Infrared (FLIR) radar display was selected as the background for combinations with other sensor displays in trials of suitability, with color coded close, intermediate, and far range conditions. Test subjects were 32 right-handed males who performed point of impact, target detection, and tracking tasks. The variables were processed in univariate and multivariate analyses of combined and uncombined display types, and individual display comparisons by pairs. The combined displays were found to enhance the time-sharing of tasks with other crewmembers and the accurate detection of targets. Color coding is recommended to be of secondary value, with some results showing that colors actually slow response times. M.S.K.

A82-22974 **Direct comparison of community response to road traffic noise and to aircraft noise.** F. L. Hall, S. E. Birnie, S. M. Taylor, and J. E. Palmer (McMaster University, Hamilton, Ontario, Canada). *Acoustical Society of America, Journal*, vol. 70, Dec. 1981, p. 1690-1698. 23 refs. Research supported by the Transport Canada and Natural Sciences and Engineering Research Council of Canada.

Previous efforts to synthesize information on community responses to various noise sources have been forced to rely on a variety of surveys conducted in different countries over a number of years. Data collected recently around Toronto International Airport provide a direct comparison of response to two sources, based on 673 interviews of persons exposed to a variety of levels of both aircraft and road traffic noise. The results of that analysis do not support the assumption that response to these two noise sources is the same. For the same value of the 24-h energy-averaging metric, a greater percentage of the sample is highly annoyed by aircraft noise than by road traffic noise. Possible reasons for this contradiction of the results of a previous synthesis of noise surveys are discussed. (Author)

A82-23027 **GTD terrain reflection model applied to ILS glide scope.** R. Luebbers, V. Ungvichian, and L. Mitchell (Ohio University, Athens, OH). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, Jan. 1982, p. 11-20. 20 refs. USAF-supported research; U.S. Department of Transportation Contract No. FA7WA-3549.

A terrain reflection model based on the geometrical theory of diffraction is described which (1) can accommodate any piecewise linear terrain profile, (2) requires less computer time than physical optics models, (3) is capable of including transverse terrain effects, and (4) determines the reflected fields with all important diffraction and blockage effects included. The model's approach to the calculation of the reflected magnetic fields consists of a geometrical process by which the existence and the reflection and/or diffraction points of the rays are determined, and a mathematical process by which the magnitude and phase of the corresponding electric field at the receiver location are evaluated. O.C.

A82-23029 **Sensitivity reduction by double perfect model following.** T. Okada, M. Kihara, and K. Motoyama (Defense Academy, Yokosuka, Kanagawa, Japan). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, Jan. 1982, p. 29-38. 12 refs.

A double perfect model following (DPMF) system is proposed which uses two models: one is used to define the desirable response and the other is used to reduce sensitivity to parameter perturbation. The concept is shown and methods of model selection and controller synthesis are discussed, followed by numerical examples and an aircraft control example which demonstrate performance of the DPMF concept. It is shown that the DPMF system can be less sensitive than a nominally equivalent single perfect model following (SPMF) system and that sensitivity reduction is enhanced by proper selection of the model. It is also shown that the sensitivity of multi-input systems can be reduced componentwise or blockwise by using a decoupled type model. (Author)

A82-23031 # **Stereographic projection in the National Airspace System.** R. G. Mulholland and D. W. Stout (FAA, Technical Center, Atlantic City, NJ). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, Jan. 1982, p. 48-57. 10 refs.

Consideration is given to the calculation of stereographic representations of airborne targets from observations of slant range, azimuth, and altitude in a multiple radar tracking system. Emphasis is placed upon the translation of the accuracy of the surveillance information into the stereographic plane. Applications include air traffic control operations in which calculations must be performed repeatedly in real time for numerous targets without overtaxing available computational resources. (Author)

A82-23037 * **Methodology for multiaircraft minimum noise impact landing trajectories.** G. Cook, I. D. Jacobson, R. Chang, and R. Melton (Virginia, University, Charlottesville, VA). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, Jan. 1982, p. 131-146. 14 refs. Grant No. NsG-1509.

The problem of optimizing landing trajectories with respect to noise impact index is addressed. In contrast with previous work, multilandings are considered. In order to make the problem tractable the trajectories are specified in functional form with certain parameters left free for selection by the optimization methods. Constraint of aircraft dynamic behavior, trajectory separation, pilot workload, passenger comfort, and maximum noise intensity all enter into the determination of what is an allowable trajectory. A version of the quasi-Newton iterative procedure is used to determine the optimum parameter values. The results show improvement in noise impact to the airport considered and the potential for even greater improvement at many airports. (Author)

A82-23225 **Linear alpha-ray altimeter (Lineinyi alpha radiatsionnyi vysotomer).** P. S. Kamenov, D. N. Vasilev, and E. N. Vapirev (Sofiiski Universitet, Sofia, Bulgaria). *Iadrena Energiia*, no. 15, 1981, p. 24-28. 8 refs. In Russian.

The paper describes an alpha-ray altimeter which employs scintillation detection and achieves linearity between the number of counts per unit time and the altitude. The design of the altimeter is described, and experimental results are presented. Causes of errors and nonlinearities are analyzed, and ways to reduce them are discussed. B.J.

A82-23227 # **Aircraft parameter identification in the presence of atmospheric turbulence.** H. Okubo (Osaka Prefecture University, Sakai, Japan), T. Kanou (Kawasaki Heavy Industries, Ltd., Akashi, Japan), and M. Kobayakawa (Kyoto University, Kyoto, Japan). *Kyoto University, Faculty of Engineering, Memoirs*, vol. 43, July 1981, p. 364-375. 7 refs.

The paper investigates a method for the identification of unknown parameters in the dynamics of an aircraft, using flight data which are affected by random disturbances due to wind gusts. Two general algorithms, the maximum likelihood (ML) method and the extended Kalman filter (EKF) technique, along with a combination of the algorithms are examined for capability by numerical simulations. The ML algorithm requires no a priori information on the initial parameter estimates, while the EKF algorithm computes an on-line estimate of the parameter in real time, has a smaller program size, and requires less computational time and memory than the former. The combined use of the two algorithms gives a useful method for an on-line parameter estimation, using the ML algorithm as a start-up procedure, and processing the remaining data sequentially with the EKF technique. D.L.G.

A82-23250 † **Improving the accuracy of the estimates of surfactant content in jet fuels (Povyshenie tochnosti otsenki soder-**

zhaniia par v reaktivnykh toplivakh). A. F. Gorenkov, V. S. Stepanenko, and V. A. Saleev. *Khimiia i Tekhnologiia Topliv i Masel*, no. 2, 1982, p. 36-39. In Russian.

Surface processes associated with the interaction between jet fuels and water are investigated with a view to increasing the accuracy of the estimates of surfactant content in jet fuels. It is shown that when analyzing water-fuel interaction, it is essential that the meniscus condition and the presence of drops on the test cylinder walls be taken into account. In view of this, modifications to the standard jet fuel quality control procedure are proposed. V.L.

A82-23309 **Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings.** Arlington, VA, Air Traffic Control Association, 1980. 204 p.

Developments towards higher levels of ATC automation are considered along with the requirements for reduced IFR separations on final approach, an analysis of system problems using aviation safety reporting system data, and specification issues and problems in connection with air traffic control computer replacement. Attention is given to maintenance concepts for the 1980's, approaches for reducing reflections on the front surface of air traffic control displays, the price of safety, general aviation in the future ATC system, the utilization of the helicopter's versatility to improve the ATC system, the human element, international plans concerning ATC-related developments, and challenges and issues for the future. Technological developments are discussed, taking into account distributed data processing modeling for future ATC systems, lightweight ATC systems, the Discrete Address Beacon System, voice communications, and a Microwave Landing System simulation. G.R.

A82-23311 **The requirements for reduced IFR separations on final approach.** W. J. Swedish (MITRE Corp., Metrek Div., McLean, VA). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 39-43. U.S. Department of Transportation Contract No. FA80WA-4370.

This paper examines the factors which affect the feasibility of reducing IFR standards from a minimum of 3.0 nmi to 2.5 or 2.0 nmi. For those aircraft pairs which are not restricted by wake vortices, separation reduction is likely to be limited by the rate at which aircraft must go around to avoid simultaneous runway occupancy. The runway occupancy performance required to avoid an unacceptable increase in the go-around rate is determined. The impacts of ATC improvements such as metering and spacing on the runway occupancy requirements and on the controller's decision-making workload are then presented. Alternating arrivals to close-spaced parallel runways are discussed as one means to avoid the constraints of runway occupancy and, possibly, wake vortices. Lastly, it is proposed that further research on reduced separations should address a single specific airport, in order to narrow the range of variables and thereby facilitate the identification of problems and solutions. (Author)

A82-23312 **Analysis of system problems using aviation safety reporting system data.** R. L. Grayson (Battelle Columbus Laboratories, Mountain View, CA). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 45-49.

The Aviation Safety Reporting System (ASRS) was inaugurated in 1976 as the result of an interagency agreement between the FAA and NASA. It was designed as a confidential, voluntary reporting system to enable individual users or observers of the National Aviation System to record hazardous occurrences or to report conditions which might adversely affect aviation safety. A description is presented of the system operation, the characteristics of the data base compiled by the system as the principal information source, and the ways in which the system has helped in defining and clarifying various aviation system problems. G.R.

A82-23313 **Air Traffic Control computer replacement - Specification issues and problems.** T. L. Hannan and M. E. Perie (FAA, Washington, DC). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 51-56.

The foundation of today's Air Traffic Control (ATC) system is the ATC specialist, who is supported by ATC automation systems and automated radar terminal systems. According to many ATC experts, however, the computer will become the foundation of the future ATC system. The transition to the future ATC system will be gradual. The extent to which decision-making processes will be accomplished automatically will increase until significant elements of the ATC process are controlled by the computer. Attention is given to an ATC Computer Replacement System which is suited for the evolutionary transition process. In the form of its initial implementation, the new system must be compatible with the ongoing ATC system. But it must also be capable of meeting future ATC functional requirements as it evolves toward automated decision-making. The considered requirements are examined in an attempt to define the scope of the ATC computer replacement acquisition. G.R.

A82-23314 **Reducing reflections on the front surface of air traffic control displays.** J. W. Aschenbach (FAA, Technical Center, Atlantic City, NJ). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 65-71. 5 refs.

Problems related to the occurrence of surface reflections on the FAA's en route air traffic control displays have become more serious in connection with the installation of the near vertical stroke-writing display in the air route traffic control centers. New investigations were initiated to see if it was feasible to raise the display background level, in order to mask reflections and to further reduce the sources of plan view display screen reflections through more modifications to the lighting. A study was conducted with the objective to find a method of decreasing the reflectivity of the front surfaces of the display itself. By eliminating the extra panel on the front of the display and by etching and coating the outside surface of the CRT with a multilayer dielectric thin film, it was possible to produce a display with very little glare. G.R.

A82-23315 **NAS system load - Utilization of the DARC system.** E. P. Schmidt (FAA, Hampton, GA). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 73-78.

In connection with an unexpectedly large increase in air traffic volume, there is a growing threat that ATS requirements might exceed the processing capacity of the NAS En Route 9020 computer systems. An investigation is conducted concerning the feasibility of providing an interim solution to the problem by means of an approach based on the utilization of existing hardware allocations. The approach would employ the Direct Access Radar Channel (DARC) system as an associative processor to the NAS 9020 system. DARC is specified to provide a parallel radar data path for use in the event of catastrophic failure of the prime channel, and during planned down time of the NAS 9020 system. G.R.

A82-23316 **Utilizing the helicopter's versatility to improve the ATC system.** A. G. B. DeLucien and F. D. Smith (Pacer Systems, Inc., Arlington, VA). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 89-96. 14 refs.

This paper presents an overview of certain operating environments of civilian helicopters, and summarizes selected performance-maneuver envelopes of those models certified for operation under instrument flight rules (IFR). It discusses how the capabilities and limitations which are unique to these vehicles can be used to improve the capability, and expand the capacity, of the Air Traffic Control (ATC) system. Helicopter-oriented technical issues which will impact future changes to the system are identified. The paper concludes that as controllers become increasingly aware of related helicopter characteristics and operating environments, and take advantage of them, the effect would be to reduce controller workload; and to increase the capacity, expand the functional capabilities, and enhance the overall versatility of the ATC system. (Author)

Co., Fairfield, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811052.* 15 p.

Powerplant operational and maintenance procedures are reviewed to minimize fuel consumption and total operating costs of existing large turbofan engines. Recommendations are made to reduce the rate of on-wing performance deterioration and to define cost effective performance refurbishment. Measures being taken to increase fuel and cost savings include the development of performance diagnostic/analytical systems to permit better management control of engine operating costs. On-wing performance retention can be improved by the observance of line maintenance and operational procedures minimizing the impact of the major causes of performance deterioration, such as increased clearances, erosion, contamination and leakage. D.L.G.

A82-24395 **Airline fuel saving through JT9D engine refurbishment.** J. W. Allison and D. R. Weisel (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811051.* 12 p.

Since the JT9D engine entered airline service in 1970, increase in the price of jet fuel made it imperative to devise refurbishment procedures for in-service engines to improve their fuel economy. Developments leading to performance recovery and improvement of the engine are related to fan leading edge rework, and the one degree open first stator. Factors responsible for engine performance recovery and retention include also operational procedures, test configuration, and prevention of aircraft system pneumatic leakage. Attention is given to the fan strip panel concentric grinding tool, a properly repaired combustor with recently developed 'S-16' fuel nozzles, recommended refurbishment additions, operational procedures to maximize performance retention, a test configuration, and inspection techniques. G.R.

A82-24396 **Airworthiness considerations in the design of commercial transport aircraft.** J. R. Koch (Lockheed-California Co., Burbank, CA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811039.* 14 p. 8 refs.

Design requirements and development, and the maintenance practices required in the certification of commercial transport aircraft and in the ensuring of their continuous airworthiness in operation, are considered with attention to: (1) airworthiness philosophy and criteria; (2) the evolutionary character of design development; (3) the scope of development testing; and (4) the enlistment of manufacturer, operator and regulatory agency in airworthiness assurance throughout an aircraft's operational life. Also considered are the airworthiness regulation revisions and technological advances that have resulted in changes in the substantiation of airworthiness, especially in the case of structures. O.C.

A82-24397 **Designing for continued airworthiness - General aviation.** C. A. Rembleske (Beech Aircraft Corp., Wichita, KS). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811038.* 8 p.

The Air Commerce Act of 1926 became the first piece of U.S. legislation which provided a basis for the writing of airworthiness standards for aircraft. The contents of the Air Commerce Regulations are briefly discussed. In connection with the technological developments of a rapidly growing industry, the regulations became more complex. Beginning in 1974, FAA introduced the term 'continued airworthiness'. Continuing airworthiness can be defined as keeping the aircraft flying safely and functioning properly over an indefinite period. Attention is given to the airframe, the propulsion system, basic flight instruments, vital hydraulic lines, fuel systems, electrical systems, and problems of wear and tear. G.R.

A82-24398 **The anatomy of a technology test bed - Integrated Flight/Fire Control-I /IFFC I/.** V. M. Marti, J. Woods, Jr. (McDonnell Aircraft Co., St. Louis, MO), and W. F. Swartz (USAF, Wright Aeronautical Laboratories, Dayton, OH). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811036.* 17 p.

The purpose of technology demonstration is to reduce the risk associated with developing an advanced operational system by verifying the capability of advanced, and as yet unproven, technologies. Attention is given to today's conditions which require the use of a technology demonstrator aircraft, principally as a precursor to future military tactical aircraft systems. The ingredients of a good technology demonstrator are examined, taking into account the selection of the F-15B aircraft for the technology demonstration of the Integrated Flight and Fire Control (IFFC) program. The IFFC system concept is considered along with the IFFC data acquisition systems, and the IFFC onboard simulation systems. G.R.

A82-24399 **Mission-adaptive wing flight demonstration program.** D. K. Gould (Boeing Co., Seattle, WA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811035.* 10 p.

It is reported that the design and fabrication of the AFTI/F-111 mission-adaptive wing is nearing completion. The variable-camber airfoil design, unlike conventional wings, possesses no discontinuities from spoilers, flaps or fairings to disturb the flow of air over the wing. The flexible leading edge is continuous from wing root to tip, and the flexible trailing edge is divided into three segments to provide roll control redundancy, permit operation at various sweep-settings of the F-111 variable wing, and to allow spanwise shifting of the aerodynamic load. Wind tunnel and flight simulation tests indicate aerodynamic performance benefits, and the structural capability that has been checked by finite element analysis is in turn verified by tests of a wing section loads and actuation test rig. Flight tests are to begin in late 1982. O.C.

A82-24400 **Quality, quantity, and technology - A perspective on fighter development.** S. K. Jackson, Jr. (General Dynamics Corp., Fort Worth, TX). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811097.* 14 p. 7 refs.

The consequences of long-term technological development on military aircraft unit costs are illustrated, by means of comparisons between the capabilities and costs of such World War II aircraft as the P-51 fighter and B-17 bomber, on the one hand, and the contemporary F-16 fighter, on the other. A detailed historical analysis of the B-17 Schweinfurt raids and the extrapolation of the capabilities of the F-16 to that 1943 scenario shows that, while the modern fighter is able to deliver a greater bomb load with greater accuracy in a greater variety of conditions than the B-17, its cost, as a fraction of GNP, is only 1.6-2.3 times greater than that of the B-17. Similar improvements are demonstrated for the cases of operational readiness and numbers of maintenance personnel, showing that the continuing development of airframes is justified. The development of experimental aircraft is recommended. O.C.

A82-24401 * **Aircraft surface coatings for drag reduction/erosion protection.** R. L. Kreitinger (Boeing Commercial Airplane Co., Renton, WA) and D. B. Middleton (NASA, Langley Research Center, Hampton, VA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811070.* 16 p. 5 refs.

The laboratory testing of a large number of films and liquid coatings for aircraft drag reduction and erosion protection has led to the identification of elastomeric polyurethanes, which fulfil smoothness, durability and protection requirements while being easily applied to large, compound-curvature areas with standard spray equipment. It was found that an epoxy primer produced a stronger bond between coating and substrate than a wash primer. A drag-reduction value of 0.2% was achieved with a commercially-available elastomeric polyurethane. O.C.

A82-24403 **Future strike fighter options - Concepts and technologies.** P. C. Bavitz (Grumman Aerospace Corp., Bethpage, NY). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811099.* 19 p. 10 refs.

Results are presented from a study of concepts of operation, and the technological capabilities required by them, for future strike fighter weapon systems. The design concepts considered by the study were: (1) a low-altitude, medium-payload twin-turbofan design with mission-adaptive supercritical wing and close-coupled canard; (2) a low-altitude, heavy-payload craft with top-mounted inlets; (3) a high-altitude concept with advanced turbojet engines and Alben-type nozzles, equipped with air-to-ground weapons that are currently in the conceptual-development stage; (4) a high-altitude/dive mission-profile craft possessing high payload/weapon carriage flexibility; (5) an advanced, low radar cross section design incorporating a delta wing planform, flush engine inlets and a top-mounted carriage for WASP weapons; and a gunship with a single, top-mounted turbojet whose primary armament is a GAU-8 30 mm cannon. O.C.

A82-24404 **Technology for quality and quantity in a new fighter.** W. E. Maillard (Northrop Corp., Los Angeles, CA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811100.* 15 p. 15 refs.

It is demonstrated to be premature, in view of the complex and evolving character of tactical aircraft design problems requiring tradeoffs between system quality and production quantities, to hold a single design concept as superior to alternatives. However, technology application is held to be essential for the mediation of quality and quantity criteria. After identifying such major forces in cost escalation as the compounding of requirements and technology-packing, in response to mission requirement uncertainties over the course of a lengthy design development process, a design approach to lower-cost fighter concepts is introduced and quantitative methods are presented to illustrate potential improvements in the operational capabilities of aircraft in the size and cost range represented by the F-5E and F-16 fighters. O.C.

A82-24405 **Operating flight loads and their effect on engine performance.** R. L. Martin (Boeing Commercial Airplane Co., Renton, WA) and W. J. Olsson (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811071.* 14 p.

Flight loads imposed on high bypass turbofan engines and the response of the engines to these loads are examined. The effects of nacelle angle of attack, aircraft speed, and engine airflow are discussed. Results from an analysis of the NASA JT9D flight load test indicate that aerodynamic loads on the nacelle are the prime cause of cold section clearance closure and rubs; and aerodynamic loads, thrust, and differential thermal expansion cause hot section closure and rubs. Inboard and outboard engines are found to be equally affected by flight maneuvers, and a 0.7% increase in cruise thrust-specific fuel consumption is found to be typical of production aircraft acceptance testing. D.L.G.

A82-24406 **Restoration of performance, Models 727, 737, and 747.** J. C. Baer and W. M. Staab (Boeing Commercial Airplane Co., Seattle, WA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811072.* 12 p.

A new generation of advanced technology, fuel-efficient jet transports, including the Models 757 and 767 will enter commercial airline service in 1982. Existing fleets of second-generation jet transports still in production, such as the 727, 737, and 747, have useful economic lives which will extend into the 1990s. Because of this longevity and the continual escalation of fuel prices, the economics of these transports will be improved. A description is presented of some of the performance improvement programs. Attention is given to aspects of operational efficiency, the in-flight fuel economy, a maintenance program to preserve low drag characteristics for the aircraft, the elimination of surface roughness, Model 727 drag improvement items, Model 747 improvement items, recently developed items, aerodynamic improvements under study, and propulsion system and flight management system improvements. G.R.

A82-24407 **High temperature engine control electronics.** D. C. Dening (General Electric Co., Syracuse, NY). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811074.* 11 p. Contract No. N00173-79-C-0010.

Integrated injection logic is shown to be operable at temperatures up to 300 C. The logic can thus be used in the digital control mounted on aircraft engines, where it is subjected to high temperatures and severe vibration. The design of integrated injection logic circuits for such high-temperature applications is discussed. Particular attention is given to gate design, to the patterns of interconnection, and to the metallization system employed. Also described is a data input chip for an engine control computer that has been designed for high-temperature applications. C,R.

A82-24408 **Pressure transducer calibration process.** F. Antonazzi, Sr. (Bendix Corp., Energy Controls Div., South Bend, IN). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811076.* 9 p.

It is shown that quartz capsule pressure transducers using a closed loop capacitance bridge can be made highly accurate with virtually identical frequency response by using a calibration process that compensates for the quartz pressure sensor unit-to-unit variations. Digital integration gain scheduling as a function of N count results in a constant loop gain that is independent of pressure level. As a consequence, constant dynamic characteristics are obtained at all pressure levels. It is noted that plug-in pressure transducer units are interchangeable, requiring no select-at-test components or trim adjustments. The software loop closure allows use of a common printed wiring board with identical electrical components for a wide range of pressure transducers. C.R.

A82-24409 **Performance retention features of the PW2037.** J. K. Carriere (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811054.* 14 p.

Studies that have been carried out on the causes of performance deterioration are surveyed, as are descriptions of design and maintenance features for improving performance retention. It is noted that short-term deterioration is caused by flight loads that cause rubbing of blades on seals and consequent loss of module efficiencies. Long-term deterioration derives from erosion of airfoils and seals during ground operation and cyclic-induced thermal distortion of the high-pressure turbine vanes. Design features for improving performance retention include increased case and rotor stiffness, damped bearings on centering springs, a third low rotor bearing, active clearance control, abradable blade tips seals, controlled diffusion airfoils, dirt removal scoop, erosion-resistant compressor outer air seals, improved diffuser and combustor and reduced aspect ratio turbine vanes. C.R.

A82-24410 **Reliability analysis of a dual-redundant engine controller.** E. Gai, J. V. Harrison, and R. H. Luppold (Charles Stark Draper Laboratory, Inc., Cambridge, MA). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811077.* 11 p.

A Markov model is developed for predicting the reliability of a full-authority, dual-redundant aircraft engine controller. The effects of failures on any of the controller's sensors, electronic interface modules, processors and actuators are modeled, as are the consequences of redundancy management decisions. The model's use in performing parameter sensitivity studies and developing quantitative data in support of design trade-offs is described. The effects of scheduled maintenance on the inflight shutdown rate of the engine are assessed. C.R.

A82-24411 **Propulsion multiplexer /PMUX/ system - The missing link.** M. S. Latina and W. W. Hixson (United Technologies Corp., Hamilton Standard Div., Windsor Locks, CT). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811078.* 10 p. 7 refs.

The importance placed by commercial airlines on more efficient and reliable engines with lower maintenance costs has led to the use of in-flight engine condition monitoring equipment as part of an airborne integrated data system (AIDS). This monitoring requires that the AIDS receive approximately 25 engine parameter signals. Problems arise in that the integrity of the AIDS input signals from the engine is not the responsibility of a single equipment supplier. To resolve this problem, a centralized, engine-mounted data processing device for the engine signals is proposed. It is pointed out that the unit for this Propulsion Multiplexer System can be divided into three major functional groups: (1) pressure sensors and signal interfaces, (2) digital processor and memory, and (3) serial digital data interface. C.R.

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Energy management and its impact on avionics; Proceedings of the Symposium, London, England, March 19, 1981
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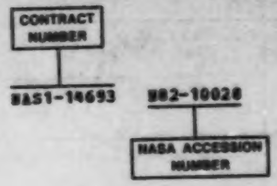

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A82-23317 **International plans for civil and military coordination.** P. J. Gray (RAF, National Air Traffic Services, London, England). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 105-108.

Attention is given to a review of the common aims of the civil and military controller, certain conflicts of interest inherent in the function of civil and military air traffic control, and the resolution of conflicts related to the existence of national boundaries in Western Europe. In connection with the finite nature of air space, it is found to be important that, in an allocation of the utilization of this space, the needs and characteristics of all users, civil and military, must be taken into consideration. In the UK, integrated civil and military staffs at HQ and field levels are used to ensure that no one user interest is permitted to unfairly predominate. In the wider European context civil and military coordination and cooperation prevails within Eurocontrol, and perhaps most successfully, at NATO CEAC (Committee for European Airspace Coordination). G.R.

A82-23318 **Operational air traffic in the Federal Republic of Germany.** F.-W. von Schlichtkrull (Bundeswehr, Frankfurt am Main, West Germany). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 111-117.

Aspects of traffic volume are considered, taking into account the number of civil and military aircraft flights for 1979. For an appropriate evolution of the performance involved in controlling the total number of flights reported (3,950,000), the geographic size of the Federal Republic of Germany must be taken into account, giving attention also to regulations which exclude military aircraft from an area near the iron curtain border. Military operational air traffic can be divided into three categories, including uncontrolled military flights, military air traffic under the control of air defense units, and military air traffic handled by Air Traffic Services. The high air traffic density leads to special problems which are partly related to midair collision hazards. Approaches for solving these problems are discussed, taking into account a separation in space for flights of different traffic categories, and an employment of advanced control methods. G.R.

A82-23319 **Distributed data processing modeling for future ATC systems.** R. R. Jones (Hughes Aircraft Co., Fullerton, CA). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 125-131.

The use of distributed processing procedures makes it feasible to reduce the processor cost, and to increase, at the same time, maintainability and reliability. Other advantages are related to the convenience of system expansion by means of added capabilities. The utilization of distributed data processing benefits for air traffic control systems (ATC) is considered, taking into account the use of a rigorous analytic technique for a determination of optimal operational configurations. The analytic technique selected is simulation modeling. This approach makes use of a Distributed Data Processing Model (DDPM) coupled with a Design Analysis System (DAS). The considered approach has been employed extensively to design many complex systems similar in scope and nature to ATC systems. A description is presented of the DDPM and the DAS, giving attention to the use of these techniques in an application involving an ATC system. G.R.

A82-23320 **ATC automation - A look forward: Technology/architecture.** L. M. Reppert (Texas Instruments, Inc., Dallas, TX). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 133-136.

It is pointed out that ATC automation is going through a revolutionary evolution due to major technological advances in such areas as microprocessors and memories. A reasonable projection prediction for the 80's and 90's would specify a high utilization of distributive computer architecture implemented with simple/high technology hardware. The considered evolution will require a system which is functional-task oriented, repartitionable, and modular. Using distributed computer architecture and available microprocessor and memory technologies, ATC system designers can perform all the required functions and implement the system in a highly efficient and cost effective manner which inherently provides the desired characteristics, taking into account modularity, recoverability, high data integrity, ultra-high reliability, and computer-aided maintainability. G.R.

A82-23321 **Lightweight ATC systems.** R. Bonitch (Eaton Corp., AJL Div., Farmingdale, NY). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 139-144.

The problem of tactical ATC system implementation has been considered, taking into account the generation of light-weight and low-cost equipment which can provide advanced ATC capabilities for forward command posts, tactical command centers, and low traffic density applications, such as remote airfields and oil rigs. The considered systems are based on microprocessor technology. This technology makes it possible to utilize recent advances related to signal processing, antenna development, and plasma displays. Attention is given to the development of the Small Plasma Automated Radar Terminal Area Navigation System (SPARTAN) and its military version, the Very Lightweight Air Traffic Management Equipment (VLATME). The advantages of the employed ac plasma displays are related to light weight, low operating voltage (200 volts), and sustained memory. G.R.

A82-23322 **Discrete Address Beacon System /DABS/.** P. D. Hodgkins (FAA, Washington, DC). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 147-155.

In connection with the results of a study conducted in 1969, recommendations had been made to upgrade the Air Traffic Control System. These recommendations became the basic system requirements for DABS. The recommendations had been concerned with the development of three new systems, including an improved surveillance system for the eventual replacement of the present Secondary Surveillance Radar (SSR), a digital air/ground data link communication system, and a ground-based collision avoidance system. Probably the most significant characteristic of the DABS is that it is a direct extension of and fully compatible with the SSR or the ATC Radar Beacon System (ATCRBS), as it is referred to in the U.S. Although primarily a surveillance system, DABS is also a communications and ground-based collision avoidance system designed with sufficient capacity to accommodate expected air traffic growth well into the next century. G.R.

A82-23323 **A Microwave Landing System simulation.** R. P. Spengler and R. W. Zoladz (Computer Sciences Corp., Pomona, NJ). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings. Arlington, VA, Air Traffic Control Association, 1980, p. 157-162.

Computer software is being developed for a series of experiments involving the simulation of Microwave Landing System (MLS) operations. The purpose of these experiments is to identify, or at least obtain advanced warning of, potential problem areas in an MLS implementation. The MLS simulation model is divided into three phases. Each phase represents a different level of avionics and thus provides capabilities for different approach paths. Emphasis is placed on the ATC communications and the various approach geometries. The MLS is an air derived system in which ground based equipment transmits accurate approach information to a receiver on board the aircraft. Azimuth, elevation, and ranging elements comprise the system operating in the microwave band (approximately 5000 megahertz). With MLS, aircraft can enter the approach area from various directions and speeds and fly toward separate approach gates. G.R.

A82-23324 **Voice communications - The vital link.** R. E. Hustead (Litton Industries, Amecom Div., College Park, MD). In: Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings.

Arlington, VA, Air Traffic Control Association, 1980, p. 165-168.

Voice communications provides the vital link among controllers and between controllers and aircrews. Communications systems presently in use provide voice communications via three links, including intercom (between different air traffic controllers), interphone (between different sites), and radio (between the air traffic controller and the pilots). It is pointed out that current communications systems at most air traffic control facilities are generally outdated, inflexible, and difficult to maintain. Attention is given to needs for a new voice communication system which is able to handle the peak loads of air traffic that the facility will encounter. Amecom's Integrated Voice Communications Systems satisfies these needs and is available now. The system has been designed specifically for the Air Traffic Control environment. Aspects of system operation are discussed in some detail. G.R.

A82-23368 **Fighters - Tomorrow's terminology.** G. Warwick. *Flight International*, vol. 121, Feb. 6, 1982, p. 291, 292, 301, 302.

Consideration is given to the technological features under study for integration into fighter aircraft designs over the course of the 1990s. These features include: (1) fly-by-wire and fly-by-light active electronic controls, which will permit the modification of flight characteristics through reprogramming of software control laws; (2) the use of primary, directional-reinforced composite structures that will aeroelastically deform in flight to increase aerodynamic efficiency; (3) the improvement of wing aerodynamics through the downstream effect of canards; (4) the use of conformal stores carriages to reduce drag by as much as 60%; (5) the generation of direct lift force control by means of coordinated wing/canard control surface actuation; and (6) the vectoring of engine exhaust nozzles to increase lift and maneuverability. O.C.

A82-23369 **Boeing's big, quiet 737-300.** B. Sweetman. *Flight International*, vol. 121, Feb. 13, 1982, p. 353-356.

A description is given of the modifications made on the precursor 737-200 commercial aircraft design to yield the 737-300, which include: (1) greater wing and horizontal stabilizer spans; (2) fuselage extensions totalling 104 in; (3) leading edge slat airfoil redesign; (4) the incorporation of adhesive bonding construction techniques and more advanced aluminum alloys for longer service life; and most importantly, (5) a new engine installation that will accomodate either CFM 56-3 or RJ-500 turbofans. The modified aircraft is expected to meet FAR 36 Stage 3 noise limits, and to be more fuel-efficient than its predecessor. In the context of the present commercial aircraft market, the 737-300 represents a transitional design which will be replaced by a novel, 150-passenger short-haul aircraft. O.C.

A82-23426 **Israel Annual Conference on Aviation and Astronautics, 23rd, Tel Aviv and Haifa, Israel, February 11, 12, 1981, Collection of Papers.** Conference supported by the Technion - Israel Institute of Technology, Israel Ministry of Defence, Ministry of Transport, et al. Haifa, Israel, Technion - Israel Institute of Technology, 1981. 251 p.

Topics significant to modern aircraft design and performance, design and efficiency, and to control logic were examined. Flow past an airfoil in a supersonic stream was discussed, as were drag reduction by means of an active boundary layer thickening, the aerodynamic characteristics of an axisymmetric configuration with transverse jets in the base plane, and coherent structure of the turbulent boundary layer in the lateral direction. A general similarity solution of the transonic equation in the physical plane was presented, and perturbations to unidirectional turbulent flow due to small lateral mean velocity gradients were studied. Discussions were devoted to the evaluation of stiffened shell characteristics from imperfection measurements, to fixed gain controller design for aircraft, and to a time finite element discretization of Hamilton's law. M.S.K.

A82-23439 # **Low grade fuels for turbo and jet engines.** B. Gal-Or, E. Zahavi, and A. Burcat (Technion - Israel Institute of Technology, Haifa, Israel). In: Israel Annual Conference on Aviation and Astronautics, 23rd, Tel Aviv and Haifa, Israel, February 11, 12, 1981, Collection of Papers. Haifa, Israel, Technion - Israel Institute of Technology, 1981, p. 170-180.

In connection with the energy crisis, a program has been initiated to reexamine the design methodologies and the expected performance characteristics of turbo and jet engines in the light of the higher temperatures and reduced durability that would result from the increasing use of low-grade, high-aromatic aircraft fuels. The discussion focuses on the first phase of the program which includes simulated computer studies of the maximum flame temperatures exptected in jet engine combustors with different fuels under various operating conditions such as takeoff, cruise, and idle performance at various altitudes and Mach numbers. General parameters are proposed for the comparison of alternative fuels in terms of the maximum flame temperatures and the combustion products distributions. V.L.

A82-23441 # **Fixed gain controller design for aircraft.** Y. Baram and D. Eidelman (Tel Aviv University, Tel Aviv, Israel). In: Israel Annual Conference on Aviation and Astronautics, 23rd, Tel Aviv and Haifa, Israel, February 11, 12, 1981, Collection of Papers, Haifa, Israel, Technion - Israel Institute of Technology, 1981, p. 211-216. 6 refs. Grant No. AF-AFOSR-80-0178.

A method for designing fixed-gain controllers for systems with large parameter variation is presented, with particular attention to the problem of designing non-adaptive back-up control systems for high performance aircraft. The approach, based on minmax information criteria, is used to design a fixed-gain controller and a state estimator for a given aircraft, and is shown to provide good performance qualities. (Author)

A82-23444 **YF-16 design concept and philosophy.** H. J. Hillaker (General Dynamics Corp., Fort Worth, TX). *(Israel Annual Conference on Aviation and Astronautics, 23rd, Tel Aviv and Haifa, Israel, Feb. 11, 12, 1981.) Israel Journal of Technology*, vol. 19, no. 1-2, 1981, p. 3-18.

The design objective of the original YF-16 was to maximize the usable maneuverability and agility of the aircraft in the air combat arena at a mission radius of 500 n.mi. This objective was to be achieved within a flyaway cost of 3 million dollars per unit. To this end, emphasis was placed on small size and low weight/cost, on advanced technologies, and on design/aerodynamic innovations. The key configuration elements that offered clear superiority in terms of maximum lift, directional stability, drag-at-lift, and inlet flow field were bottom inlet, wing-body blending, variable camber, and single vertical tail. New wing planforms which are being tested on F-16, will allow even greater capabilities while retaining the low-cost concept. A single turbofan engine provides the best balance of combat capability and mission radius for the lowest weight. V.L.

A82-23470 **Improvement of fuel economy by flying with maximum rearward center-of-gravity positioning (Verbesserung der Treibstoffökonomie durch Fliegen mit zulässiger rückwärtiger Schwerpunktlage).** M. Caspari and D. Kricke (Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der Zivilen Luftfahrt*, vol. 17, no. 3, 1981, p. 142-146. In German.

The relationship between balance, stability, and maneuverability is established, and means of minimizing the moment of an aircraft's horizontal stabilizers and elevators to conserve energy are discussed. Requirements and peculiarities of INTERFLUG aircraft are described, and current techniques to save fuel by achieving a higher rearward center-of-gravity positioning are discussed. Particular attention is given to the retention of rearward center-of-gravity positioning in the IL-62/IL-62M aircraft. Calculations show that procedures exist to achieve a rearward center-of-gravity positioning of 33%, which would result in a minimum fuel savings of 4.1% at 165 g/km. J.F.

A82-23603 **High-frequency monitoring of surface layers of metals.** A. L. Dorofeev, N. P. Kalinin, and V. D. Ostapenko (Kalinin Carburetor Plant, Perm, USSR). *(Defektoskopiia*, Apr. 1981, p. 34-40.) *Soviet Journal of Nondestructive Testing*, vol. 17, no. 4, Dec. 1981, p. 268-272. Translation.

A high-performance electromagnetic device working at 100-500

A82-24412 **LAMPS III recovery assist, securing and traversing /RAST/ system.** F. Cracknell (DAF Indal, Ltd., Mississauga, Ontario, Canada). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811080.* 9 p.

The main portions of the RAST system are outlined, with descriptions given of their functions. Some of the ground and flight test experience gained thus far is summarized. The system is shown to meet the requirements of the Light Airborne Multi Purpose System (LAMPS). This latter system depends for its success upon the ability to operate helicopters safely and reliably under weather conditions where the ship roll angles reach about 30 deg and the wave heights reach 13 feet. C.R.

A82-24413 **The use of 'Kapton' polyimide film in aerospace applications.** D. H. Berkebile and D. L. Stevenson (Du Pont de Nemours and Co., Wilmington, DE). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811091.* 9 p.

The principal steps involved in the manufacture of wire and cable insulated with 'Kapton' are described. The latest shop handling techniques are reviewed, among them automated stripping and high-speed marking. Additional aerospace applications in avionics and insulation blankets are discussed. Tables summarizing the performance characteristics of wire insulated with this polyimide film are included. C.R.

A82-24415 **Fighter issues - 2000.** D. R. Kozlowski (McDonnel Douglas Corp., St. Louis, MO). *Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, Paper 811096.* 13 p. 6 refs.

Consideration is given to the design requirements formulated for an advanced tactical fighter (ATF) that will operate in the electronic warfare and nuclear/biological/chemical warfare scenarios anticipated for the year 2000. The performance requirements may be characterized as speed, stealth and STOL (SSS). The SSS criteria have nominal values of (1) Mach 1.8 sustained supersonic speed, with Mach 2.5 as maximum for intercept and chase, (2) less than 0.5 sq m radar cross section, reduction of IR signature and engine exhaust contrail, and electromagnetic emission control, and (3) 1500 feet total required runway length. Attention is given to the problems posed by maintainability and cost-control criteria, as well as the emerging characteristics of air-to-air combat in view of the technological developments expected from potential adversaries. O.C.

A82-24416 **Annual review of fluid mechanics. Volume 14.** Edited by M. Van Dyke (Stanford University, Stanford, CA), J. V. Wehausen (California, University, Berkeley, CA), and J. L. Lumley (Cornell University, Ithaca, NY). Palo Alto, CA, Annual Reviews, Inc., 1982. 463 p. $22.

Applications of fluid mechanics are discussed for the study of strongly nonlinear waves, the topology of three-dimensional separated flows, and the mathematical theory of frontogenesis. Attention is also given to turbulent jets and plumes, gravity currents in the laboratory, atmosphere, and ocean, and to low-gravity fluid flows, specifically for convective flows. The computation of transonic potential flows is considered, as are the strange attractor theory of turbulence, numerical methods in free-surface flows, and the fluid dynamics of heart valves. M.S.K.

A82-24426 **International Conference on Numerical Methods in Fluid Dynamics, 7th, Stanford University, Stanford and Moffett Field, CA, June 23-27, 1980, Proceedings.** Conference supported by NSF, U.S. Air Force, and U.S. Navy. Edited by W. C. Reynolds (Stanford University, Stanford, CA) and R. W. MacCormack (NASA, Ames Research Center, Moffett Field, CA). Berlin and New York, Springer-Verlag (Lecture Notes in Physics. Volume 141), 1981. 493 p. $28.

Topics discussed include polygon transformations in fluid mechanics, computation of three-dimensional horseshoe vortex flow using the Navier-Stokes equations, an improved surface velocity method for transonic finite-volume solutions, transonic flow calculations with higher order finite elements, the numerical calculation of transonic axial turbomachinery flows, and the simultaneous solutions of inviscid flow and boundary layer at transonic speeds. Also considered are analytical solutions for the reflection of unsteady shock waves and relevant numerical tests, reformulation of the method of characteristics for multidimensional flows, direct numerical simulations of turbulent shear flows, the stability and separation of freely interacting boundary layers, computational models of convective motions at fluid interfaces, viscous transonic flow over airfoils, and mixed spectral/finite difference approximations for slightly viscous flows. B.J.

A82-24562 # **On-line control for the regulation of power source in multiple-servo electro-hydraulic systems.** B. N. Suresh (Indian Space Research Organization, Vikram Sarabhai Space Centre, Trivandrum, India), W. L. Green, and D. J. Sanger (Salford, University, Salford, Lancs., England). *American Society of Mechanical Engineers, Winter Annual Meeting, Washington, DC, Nov. 15-20, 1981, Paper 81-WA/DSC-3.* 8 p. 8 refs. Members, $2.00; nonmembers, $4.00.

The efficiency of a multiple-servo electrohydraulic system, in which power can be reduced by means of an on-line self-optimizing control, depends on the selection of the most suitable among five search strategies. The strategies are considered in light of a hydraulic system mathematical model employing two velocity servos whose individual performance is simulated on a computer. Simulation results show that the Simplex is the most useful strategy for on-line implementation in a practical system, where the implementation scheme involves no more than six variables. O.C.

A82-24563 * # **Wide field of view laser beacon system for three-dimensional aircraft position measurement.** L. M. Sweet, R. B. Miles, S. G. Webb, and E. Y. Wong (Princeton University, Princeton, NJ). *American Society of Mechanical Engineers, Winter Annual Meeting, Washington, DC, Nov. 15-20, 1981, Paper 81-WA/DSC-9.* 9 p. 8 refs. Members, $2.00; nonmembers, $4.00. Grant No. NCC2-94.

This paper presents a new wide field of view laser beacon system for measurement, in three dimensions, of aircraft or other remote objects. The system is developed for aircraft collision hazard warning independent of ground-based hardware, as well as for flight research, helicopter-assisted construction and rescue, and robotic manipulation applications. Accurate information describing the relative range, elevation, and azimuth of the aircraft are generated by the sweep of a low-power fan-shaped rotating laser beacon past an array of optical detectors. The system achieves a wide angle of acceptance of laser beacon light through use of compound parabolic concentrators, which collimate the light for spectral filtering to minimize solar interference. An on-board microprocessor system converts the pulse sequence to aircraft position in real time. System reliability and performance are enhanced through narrow pass filtering of the pulse signals, digital logic design to mask spurious signals, and adaptive modulation of trigger threshold levels. (Author)

A82-24565 # **Describing function analysis of nonlinear nose gear shimmy.** T. D. Burton (Washington State University, Pullman, WA). *American Society of Mechanical Engineers, Winter Annual Meeting, Washington, DC, Nov. 15-20, 1981, Paper 81-WA/DSC-20.* 9 p. 10 refs. Members, $2.00; nonmembers, $4.00. Research sponsored by the Boeing Military Airplane Co.

The design of shimmy free nose landing gear is complicated by the action of the gear hydraulic steering system. During shimmy the steering system pressure response results in loads on the gear which are highly nonlinear functions of geat motion. In order to obviate the need for extensive numerical work to analyze geat stability, the describing function method has been used to linearize the steering system response, enabling the stability to be analyzed using linear system techniques. Application of this approach to a representative nose gear/steering system showed the limit cycle amplitudes and stability boundaries of the shimmy motion to be in good agreement with results obtained numerically; the transient response was also predicted reasonably well. (Author)

A82-24566 # **Complete velocity profile and 'optimum' skin friction formulas for the plane wall-jet.** G. P. Hammond (Cranfield Institute of Technology, Cranfield, Beds., England). *American Society of Mechanical Engineers, Winter Annual Meeting, Washing-*

ton, DC, Nov. 15-20, 1981, Paper 81-WA/FE-3. 7 p. 30 refs. Members, $2.00; nonmembers, $4.00. Science Research Council Grants No. B/RG/98590; No. GR/A/44312.

An analytic expression for the complete velocity profile of a plane, turbulent wall-jet in 'stagnant' surroundings is obtained by coupling Spalding's single formula for the inner layer with a sine function for the 'wake component'. This expression is transformed at the velocity maxima to yield an 'optimum log-law' for skin friction. An approximate skin friction formula based on the 'initial conditions' of the wall-jet is also presented. The formulas are generally in good agreement with experimental data. The complete velocity profile does not exhibit the conventional 'law of the wall' behavior and modifications are consequently recommended to the usual treatment of the near-wall region in numerical calculation procedures for wall-jet flows. The use of the 'Clauser plot' method of skin friction measurement is similarly shown to be in error when applied to wall-jets. (Author)

A82-24602 * # **Influence of exit impedance on finite difference solutions of transient acoustic mode propagation in ducts.** K. J. Baumeister (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers, Winter Annual Meeting, Washington, DC, Nov. 15-20, 1981, Paper 81-WA/NCA-13.* 8 p. 24 refs. Members, $2.00; nonmembers, $4.00.

The cutoff mode instability problem associated with a transient finite difference solution to the wave equation is explained. The steady-state impedance boundary condition is found to produce acoustic reflections during the initial transient, which cause finite instabilities in the cutoff modes. The stability problem is resolved by extending the duct length to prevent transient reflections. Numerical calculations are presented at forcing frequencies above, below, and nearly at the cutoff frequency, and exit impedance models are presented for use in the practical design of turbofan inlets. D.L.G.

A82-24643 **Institute of Navigation, Annual Meeting, 37th, U.S. Naval Academy, Annapolis, MD, June 9-11, 1981, Proceedings.** Washington, DC, Institute of Navigation, 1981. 171 p. Members, $30.; nonmembers, $35.

The performance of a ring laser strapdown marine gyrocompass is considered along with a brief history of the use of marine radar, a marine NAVSTAR GPS receiver, the application of NAVSTAR differential GPS in the civilian community, the applications of a multiplexed GPS user set, and initial FAA tests on the NAVSTAR GPS Z-set. Attention is given to the Federal Radionavigation Plan, scanning strategies for Air Traffic Control radars, the View-Nav system, operational and economic benefits deriving from use of loran-C RNAV, loran-C RNAV in mountainous areas, and an analysis of loran-C system reliability for civil aviation. A description is presented of a strapdown configured land navigation system, aspects of marine simulation, bridge simulation, and an empirical INS difference monitoring procedure used to sequence SSBN NAVAID fixes. G.R.

A82-24644 # **A marine NAVSTAR GPS receiver.** R. E. Maine (Sperry Corp., Sperry Marine Systems, Charlottesville, VA). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 54-59.

Attention is given to the design philosophy, construction, programming, testing, and test results of a simplified NAVSTAR Global Positioning System (GPS) receiver for marine applications. The GPS signals are received by an omnidirectional antenna, filtered to reduce out-of-band signal levels, amplified by a low noise preamplifier, and transmitted through a coaxial cable to the interior equipment. The technique used is to stop the code clock as precisely as possible at the occurrence of a timing mark. The GPS front end is considered along with the signal amplitude interface, the receiver gain control, the microcomputer, the phase shift interface, the pseudorandom noise code generator, and a real-time flow chart. A breadboard receiver constructed as described, using largely off-the-shelf components, has been found to acquire and track the experimental satellites quite successfully. G.R.

A82-24645 * # **The application of NAVSTAR differential GPS in the civilian community.** J. Beser and B. W. Parkinson (Intermetrics, Inc., Huntington Beach, CA). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 60-74. 11 refs. NASA-sponsored research.

The NAVSTAR Global Positioning System (GPS), currently being developed by the DOD, is a space based navigation system that will provide the user with precise position, velocity, and time information on a 24 hour basis, in all weather conditions and at any point on the globe. The baseline GPS system will provide guaranteed high accuracy to only a limited number of users, mostly the military. The civilian community has to devise a variation of this system to allow for an assured, uninterrupted level of accuracy. Differential GPS provides such a capability. In connection with the conceived possibility of the use of GPS by an enemy, it is found to be necessary to implement a selective availability technical capability. Differential GPS provides an approach for the civilian community to have a guaranteed level of accuracy better than the 260 meters presently planned for GPS. G.R.

A82-24646 # **Scanning strategies for air traffic control radars.** P. R. Mahapatra and D. S. Zrnic (NOAA, National Severe Storms Laboratory, Norman, OK). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 100-105. 14 refs. U.S. Department of Transportation Contract No. FA01-80-1-Y-10524.

In connection with a history of weather-related air traffic accidents near terminal areas, it is desirable that air traffic control (ATC) radars possess the capability to detect and identify elements of weather which are hazardous to aviation. To possess the capability of hazardous weather detection in a reliable manner, a radar must employ a scan strategy such that the scan cycle is not so slow as to miss shortlived for fast-growing weather phenomena. The separation of the elevation levels of the scan cycle must be close enough to ensure the detection of storm features which may endanger air traffic. Attention is given to a study conducted to determine the most suitable scanning techniques for ATC radars, taking into account the data base for the study, the photo-interpretation of the multimoment data, the vertical spacing of scan levels, and an investigation of the lifetime of an atmospheric feature by spatial correlation. G.R.

A82-24647 # **Beyond the horizon coverage for air navigation/traffic control.** V. I. Weihe. In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 106-110. 11 refs.

An important segment of the aircraft population is engaged in routine flights under instrument flight rule conditions at low altitudes beneath and beyond the coverage of the current land-based air traffic control (ATC) aids. If the ATC system were expanded so that it readily accommodated low flying aircraft, many pilots would take advantage of the increased safety thereby made available. Attention is given to the available technical options, the Aring Communication Addressing and Reporting System (ACARS), the addition of airborne nodes to common carrier communications networks, and ATC ground communications network radio link interface subsystems. Approaches suitable for the Gulf of Mexico systems are also considered. G.R.

A82-24648 # **Loran for precise position location - The VIEW-NAV system.** M. Rogoff and P. M. Winkler (Emory University, Atlanta, GA). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 111-113.

The VIEW-NAV system consists of a loran receiver which is connected to a digital computer and visual display. The onboard computer is a small rugged and reliable digital processor. Aspects of system operation are discussed, taking into account the calibration of the loran grid and the monitoring of the grid. A description of system performance is also provided, giving attention to a number of tests which have been conducted in Long Island Sound and Chesapeake Bay. When a monitor is employed, errors of as little as a few yards are observed. To obtain reliable and accurate results in critical locations, monitors should be employed in such places. G.R.

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(Supplement 149)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in May 1982 in

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MHz is reported. Main trends in tests on the effects of the electrical conductivity, the gap, the closeness to edges, and the presence of microcracks on the parameters of the device are established. A reduction in the quality factor is observed when the transducer is placed on a part with a defect, which causes a reduction in the amplitude or even a halt to the oscillation, indicating that simple self-excited flaw detectors working at elevated frequencies can be made with high sensitivity to surface defects. D.L.G.

A82-23678 On the sonic fatigue life estimation of skin structures at room and elevated temperatures. S. Maekawa (Kawasaki Heavy Industries, Ltd., Gifu, Japan). *Journal of Sound and Vibration*, vol. 80, Jan. 8, 1982, p. 41-59. 15 refs.

The Monte Carlo method of nonlinear response analysis and a fatigue life estimation scheme based on a rheological model have been used to estimate the sonic fatigue life of heated skin structures. Calculations for a skin-stringer panel are compared with experimental data and it is found that, with properly selected fatigue notch factor, the analysis provides fairly accurate estimate of the acoustic fatigue life. The effects of temperature, static pressure, and oil canning on the acoustic fatigue life are discussed. V.L.

A82-23751 Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980. Conference sponsored by the American Welding Society. Miami, FL, American Welding Society, 1981. 183 p.

The conference focused on the welding processes most important to future commercial and military aeronautic framework design and construction, aircraft hardware reclamation, and materials evaluation. Processes covered include diffusion welding, laser welding, electron beam welding, superplastic forming, keyhole plasma arc welding, inertia welding, and resistance welding. Other topics include weldability of critical materials and alternatives, welding supports such as adaptive controls, digital arc welding programmers, and the application of fracture control. Finally, repair welding is discussed. V.L.

A82-23753 Novel approaches to electron beam welding machine utilization. F. S. Pogorzelski (McDonnell Aircraft Co., St. Louis, MO). In: Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980. Miami, FL, American Welding Society, 1981, p. 41-53.

Several applications that require unique and novel approaches to the utilization of electron-beam welding equipment for profitable production are discussed. One of the applications is the welding of F-15 pylon posts fabricated from annealed Ti-6Al-4V die forging. A 100% penetration first weld pass in a tapered thickness butt joint is produced using a chart programmer set up with the plot of the high voltage required versus position along the length of the tapered joint; the programmer is coupled to the power-stat of the electron-beam welding machines so that the welding power is increased automatically to the proper value as the welding gun traverses from the thick to the thin section of the joint. Electron-beam welding of F-15 wing skin 'kick rib' machined from a solid plate of Ti-6Al-4V and the development of a blind tracking device for electron-beam welding are also discussed. V.L.

A82-23754 Diffusion bonding in superplastic forming/diffusion bonding. J. R. Williamson (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980. Miami, FL, American Welding Society, 1981, p. 55-83. 8 refs.

Mechanisms of the superplastic forming/diffusion bonding process are discussed with reference to the fabrication of titanium structures for aerospace applications. Primary factors affecting diffusion bonding are examined including process variables such as pressure, temperature, and time, and material variables such as surface roughness, surface cleanliness, and grain size. Two additional factors become important because of the nature of the process. When forming must occur prior to bonding, it is necessary to maintain surfaces to be bonded in a noncontaminated, nonoxidized condition. Secondly, when a maskant is used for selective diffusion bonding, it is important to insure that the maskant does not interfere with diffusion bonding in the adjacent nonmasked areas. V.L.

A82-23755 Aluminum and its alloys - Weldability. I. B. Robinson (Kaiser Aluminum and Chemical Corp., Pleasanton, CA). In: Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980. Miami, FL, American Welding Society, 1981, p. 85-108. 14 refs.

Non-heat-treatable and heat-treatable aluminum alloys are examined with reference to their behavior during welding and their fusion weldability. It is shown that with existing aluminum alloys, the properties of fusion welded joints can be improved by minimizing the effective heat input and by using postweld heat treatments. High-intensity welding sources can provide greater penetration and narrower welds for higher strengths. However, poor fusion weldability of many high-strength alloys is due to their composition and microstructure, and great improvements in weldability and strength would require new alloys. The use of solid-state welding techniques in conjunction with heat treatment minimizes the problems of heat damage and offers possibilities of higher-strength welds in high-strength alloys. V.L.

A82-23757 Welding for low-cost advanced titanium airframe structures. R. W. Messler, Jr. and C. A. Paez (Grumman Aerospace Corp., Bethpage, NY). In: Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980. Miami, FL, American Welding Society, 1981, p. 123-138.

The fabrication of F-14 wing center section and other wing and fuselage parts, which relies heavily on electron beam welding, is described to demonstrate that welding is a valuable, versatile, and widely available technique for building low-cost advanced titanium structures for modern airframes. The advantages of welding include improved structural efficiency, improved material utilization, expanded near-net-shape processing capability, and structural optimization. To be most beneficial, the welding processes employed should provide high joint efficiencies for static and fatigue loading, high quality, low distortion and shrinkage, and high welding speeds or deposition rates to minimize welding labor intensity. V.L.

A82-23771 # Material/structure degradation due to fretting and fretting-initiated fatigue. D. W. Hoeppner (Toronto, University, Toronto, Canada). *(Canadian Aeronautics and Space Institute, Annual General Meeting, Montreal, Canada, May 11, 1981.) Canadian Aeronautics and Space Journal*, vol. 27, 3rd Quarter, 1981, p. 213-221. 6 refs.

The causes, effects, and possible remedies for fretting fatigue are examined. Fretting occurs on the surfaces of two objects in contact and in relative motion to one another, and results in either corrosion or wear, surface stress concentrations or surface and subsurface stresses, or component failure. Models of a fretting damage threshold are reviewed, noting that once the threshold has been crossed, no further fretting damage is of concern because fatigue cracks are proceeding from the fret-induced damage. Specific areas and components subject to fretting damage on aircraft airframes, transmissions, engines, and shafting are provided, and measures to reduce fretting have included vibration elimination, slip prevention, and sealing off the part from the atmosphere. Further techniques for individual cases are indicated. M.S.K.

A82-23772 # A new approach to the problem of stress corrosion cracking in 7075-T6 aluminum. W. Wallace (National Aeronautical Establishment, Structures and Materials Laboratory, Ottawa, Canada), M. C. de Malherbe (Carleton University, Ottawa, Canada), and J. C. Beddoes. *(Canadian Aeronautics and Space Institute, Annual General Meeting, Montreal, Canada, May 11, 1981.) Canadian Aeronautics and Space Journal*, vol. 27, 3rd Quarter, 1981, p. 222-232. 7 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

A study on the potentials of retrogression and reaging (RRA) aerospace aluminum alloys in the 7000 series to gain the T73 temper and T6 strength levels is reported. The investigation covered the determination of the form of the RRA reactions in 7075-T6 Al by using hardness, yield strength, and electrical conductivity measurements, a wider range of temperatures and times which would allow thicker specimens to be treated, and confirmed the improved stress corrosion resistance. Fittings were heat treated in silicone oil baths, subjected to computer controlled servo-hydraulic tests, tested for stress corrosion crack growth rates, and treated with seawater solutions. No relation was found between stress corrosion and yield strength, and the RRA treatment produced crack growth rates similar to the T73 alloy with T6 strength. Additionally, the stress corrosion resistance of 7075 Al aged to or beyond the T6 condition was found proportional to the electrical conductivity of the material. M.S.K.

A82-23774 # **F/A-18 weapon system development.** M. J. Tkach (McDonnell Aircraft Co., St. Louis, MO). *(Canadian Aeronautics and Space Institute, Flight Test Symposium, Cold Lake, Alberta, Canada, Mar. 31-Apr. 1, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, 3rd Quarter, 1981, p. 242-252.

The design and operation of the F/A-18 cockpit, controls, avionics displays, and weapons systems control are described. The cockpit is equipped with three head-down 5 in. x 5 in. CRTs, an up-front control for communication, navigation, and identification purposes, and an HUD. The pilot needs to move his head only 22 deg from the HUD to the up-front control, while the HUD displays navigation and weapon delivery information, both air-to-air and air-to-ground. A Hands On Throttle and Switching has switches on the stick and throttle for pilot control of the weapons, sensors, and displays during time-critical periods, in addition to control of the radar modes. All AIM-7 and -9 missile firings to date have resulted in hits, while the lack of traditional airspeed indicators, coupled with the quiet cockpit and new maneuvering flaps have caused problems in maintaining airspeed control, with rectification difficult due to the complexity of the electronics. M.S.K.

A82-23826 * # **Design of supercritical swept wings.** P. Garabedian and G. McFadden (New York University, New York, NY). *AIAA Journal,* vol. 20, Mar. 1982, p. 289-291. 11 refs. Grants No. NGR-33-015-201; No. NSG-1579.

Computational fluid dynamics are used to discuss problems inherent to transonic three-dimensional flow past supercritical swept wings. The formulation for a boundary value problem for the flow past the wing is provided, including consideration of weak shock waves and the use of parabolic coordinates. A swept wing code is developed which requires a mesh of 152 x 10 x 12 points and 200 time cycles. A formula for wave drag is calculated, based on the idea that the conservation form of the momentum equation becomes an entropy inequality measuring the drag, expressible in terms of a small-disturbance equation for a potential function in two dimensions. The entropy inequality has been incorporated in a two-dimensional code for the analysis of transonic flow over airfoils. A method of artificial viscosity is explored for optimum pressure distributions with design, and involves a free boundary problem considering speed over only a portion of the wing. M.S.K.

A82-23828 # **Oscillating supersonic/hypersonic wings at high incidence.** W. H. Hui, M. F. Platzer (U.S. Naval Postgraduate School, Monterey, CA), and E. Youroukos. *AIAA Journal,* vol. 20, Mar. 1982, p. 299-304. 11 refs.

An approximate analytic method is developed for predicting the aerodynamic stability of oscillating supersonic/hypersonic flat wings at a mean angle of attack. It uses the known exact unsteady unified supersonic/hypersonic flow solution for a two-dimensional flat plate plus the strip theory approximation to obtain the formulas for the stability derivatives. They are applicable for wings of arbitrary planform shape at arbitrary angles of attack provided the shock wave is attached to the leading edge of the wing. Good agreement is obtained with existing theories in various special cases. The formulas for stability derivatives given here become exact in the Newtonian limit. (Author)

A82-24001 # **Reliability centered maintenance /RCM/.** F. S. Nowlan (United Air Lines, Inc., Chicago, IL). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 4 p.

Inherent reliability characteristics of transport aircraft are described, and principles of reliability-centered maintenance (RCM) are discussed. Airworthiness regulations are noted to be directed at failure events that have not yet occurred, but which theoretical analyses indicate have an unacceptable probability of happening. Specific requirements are communicated to engineers, and compliance results in either no occurrence of failure, or sufficient redundancy of performance to offset failure. RCM procedures involve component inspection at specified intervals, part overhaul before the failure interval is approached, discarding parts before the failure life is passed, and finding failures in hidden-function items which crewmembers may not have noticed. On-condition tasks are given higher priority, followed by a rework task and then a discard task. The effects on safety of the aircraft is the measure of the task hierarchy. M.S.K.

A82-24002 # **A310 - Design for maintenance.** R. Cutler (Airbus Industrie, Blagnac, Haute-Garonne, France). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 17 p.

The way in which Airbus Industrie deals with maintenance during the design phase is described, noting that by giving maintenance the attention it merits, its proportion of direct operating costs is kept to a minimum. Aircraft design is continuously subjected to a maintainability and reliability (M & R) review in order to ensure optimum trade-offs between M & R and other goals. This review process comprises five steps: (1) apportioning M & R goals to systems, components, etc., as required; (2) reviewing in-service experience to identify past problems and areas having the greatest potential for development; (3) evaluating design using M & R analytical techniques to identify questionable areas; (4) holding review meetings with designers and equipment suppliers to determine what improvements can be made; and (5) holding management progress review meetings to assess overall M & R performance in relation to goals, highlighting areas where goal attainment is unlikely, and specifying further actions. C.R.

A82-24003 # **Development of maintenance programmes through the functional, structural and flight test phases.** R. E. Grigg (British Aerospace Public, Ltd., Co., Weybridge, Surrey, England). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 9 p.

Methods employed by British Aerospace to develop minimized maintenance plans for use by airline mechanics are described, with particular regard to the B. Ae. 146. The 146 was designed for simplicity with constraints imposed by maintenance cost targets and monitoring to meet contractual commitments. All systems were monitored at component levels, and the occurrence of full mock-up with real hardware initiated the development of maintenance schedules. A logic analysis procedure was used to determine cost effective maintenance programs by scheduling maintenance on parts which affect safety and operational economy, and defined the tasks to be performed. Failure modes were defined for each functional component and a probability level of acceptance before catastrophic failure was set. Further steps included flight development maintenance monitoring, task monitoring, the establishment of servicing locations, design of a structural inspection program, and the definition of structure life and inspection goals. M.S.K.

A82-24004 # **Air cooled engine test facilities.** G. F. Dawson (Industrial Acoustics Co., Ltd., Staines, Middx., England). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 6 p.

The equipment and instrumentation of an operating comprehensive acoustic test facility for aircraft are described. Specifications include air cooling and the capability of handling a reheat engine with a back-on-the-bed time of 30 min after engine shut-off. The facility is totally demountable, yet includes an acoustic enclosure, an intake silencer, and augmentor tube, a primary diffuser, a secondary suppressor, a plenum chamber, exhaust splitter elements, an exhaust stack, and a weather-proofed and sound-insulated control room. Prerigged engines are mounted on the test bed over a trolley prewired and connected for all pneumatic and electronic parameters. Engine test time is reduced by 50% over conventional testing methods due to an instantaneous computerized display of test results, automatic input and logging of data, audible and visual alarm systems, diagnostic checking procedures, and manual reversion capabilities on the controls. M.S.K.

A82-24649 # **Loran-C RNAV in mountainous areas.** L. Rzonca (FAA, Technical Center, Atlantic City, NJ). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 129-140.

The loran-C kilohertz frequency provides stable ground wave propagation with signal coverage which is not limited to line-of-sight between transmitter and receiver. This feature makes loran-C very attractive for aircraft RNAV between airports located in mountainous terrain or other areas not adequately served by the VOR/DME network. An important part of an airborne loran-C evaluation program currently being conducted consists of loran-C accuracy testing in mountainous areas. The first phase, consisting of flight tests in the state of Vermont, has been completed. A description of these tests is presented, taking into account the equipment, the test scenario, and aspects of data processing. The test results obtained verify the potential of loran-C to provide aircraft navigation guidance under all terrain conditions. However, there appears to be a need for further refinement of hardware and of software techniques. G.R.

A82-24650 # **Analysis of loran-C system reliability for civil aviation.** G. A. Wong (Mitre Corp., McLean, VA). In: Institute of Navigation, Annual Meeting, 37th, Annapolis, MD, June 9-11, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 141-153. 8 refs.

The considered analysis is concerned with the ability of the loran-C system to provide continuous and usable navigation signals for airborne applications. An overview is provided of the analysis techniques, and a description is presented of the computerized loran-C coverage model which is used extensively in the reliability analysis. The probabilistic approach to reliability analysis is discussed, and the overall methodology for the analysis of loran-C system reliability in the conterminous U.S. is illustrated with the aid of an example. The ultimate objective of the loran-C system reliability assessment is to determine the ground station configuration which would meet the civil aviation reliability requirement in the post-1995 time period. G.R.

A82-24651 **Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers.** Conference sponsored by the American Institute of Aeronautics and Astronautics. New York, American Institute of Aeronautics and Astronautics, 1982. 332 p. Members, $30. nonmembers, 40.

Techniques, modeling, instrumentation, and applications of wind tunnels, wind tunnel apparatus, and models were discussed. The Shuttle testing and data base for aerodynamics predictions are examined, along with comparisons with flight data. Further attention was given to wind tunnel design and features, including tunnel liners, a quiet tunnel, choking valves, and slotted wall test sections. Techniques for instrumentation of boundary layers, surface shear stress measurements in compressible flows, laminar skin friction, and the use of aerodynamic balance systems to measure cross and cross-coupling derivatives are explored. The performance of a computer controlled variable geometry wing is described, along with the development of a self-optimizing flexible technology wing wind tunnel model, improvements in the National Full Scale Facility, and a color video display for flowfield surveys. M.S.K.

A82-24656 * # **Numerical design of the contoured wind-tunnel liner for the NASA swept-wing LFC test.** P. A. Newman, E. C. Anderson, and J. B. Peterson, Jr. (NASA, Langley Research Center, Hampton, VA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 36-47. 26 refs. (AIAA 82-0568)

A contoured, nonporous, wind-tunnel liner has been designed in order to simulate a free-flight infinite yawed-wing, transonic-flow condition about a large-chord, supercritical-section, laminar-flow-control (LFC), swept-wing test panel. The numerical procedure developed for this aerodynamic liner design is based upon the simple idea of streamlining and incorporates several existing transonic and boundary-layer analysis codes. A summary of the entire procedure is presented to indicate: what was done and why, the sequence of steps, and the overall data flow. The liner is being installed in the NASA Langley 8-Foot Transonic Pressure Tunnel (TPT). Test results indicating the aerodynamic performance of the liner are not yet available; thus, the liner design results given here are examples of the calculated requirements and the hardware implementation. (Author)

A82-24657 * # **Mean flow and noise measurements in a Mach 3.5 pilot quiet tunnel.** I. E. Beckwith and W. O. Moore, III (NASA, Langley Research Center, Hampton, VA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 48-70. 30 refs. (AIAA 82-0569)

The use of Mach 3.5 two-dimensional rapid expansion nozzle for wind tunnel testing at supersonic speeds and low noise conditions encountered in high altitude flights is described. The supersonic pilot quiet tunnel is located at the NASA Langley Research Center and a description of the facility is provided, along with instrumentation and noise measurement test data at 30, 50, and 75 psia. The mean pitot pressure distributions, rms noise levels, the effect of unit Reynolds number, wall waviness, wall contaminants, and the effects of closing the bleed valve are analyzed. Typical laminar and turbulent spectra are presented, along with a summary of the effect of slot throat adjustment on the power spectra. Comparisons are made of the power spectra with the bleed valve open and closed, and of the rms fluctuating pressures with levels from conventional nozzles, and the performance capabilities are evaluated for use in transition studies. M.S.K.

A82-24658 * # **The effect of ejector augmentation on test-section flow quality in the Calspan 8-ft transonic wind tunnel.** W. C. Rose (Rose Engineering and Research, Inc., Incline Village, NV), R. D. Hanly, F. W. Steinle, Jr. (NASA, Ames Research Center, Moffett Field, CA), and D. W. Chudyk (Calspan Advanced Technology Center, Buffalo, NY). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 71-86. (AIAA 82-0571)

Tests to determine the flow disturbances effects of four ejectors located in the corners just downstream of the diffuser in the Calspan wind tunnel are described. The flow quality in the nonejector mode is employed as the base-line configuration, and operating parameters are compared with data from other wind tunnels. During tests with the ejectors working, fluctuation levels increased between Mach 0.4-0.6, while temperature and vorticity levels remained constant. The ejector exhibited broad spectrum noise typical of free jet noise, yet static pressure measurements revealed only a slight increase in the broadband rms levels with the ejectors on, indicating negligible disturbances upstream caused by the ejectors. Choking the diffuser eliminated the jet noise, and the use of ejectors in the Mach range considered is concluded to cause no significant degradation in the Calspan tunnel flow quality. M.S.K.

A82-24659 # **An ejector augmented choking valve for the metering and control of inlet and bleed duct flows.** C. H. Boccadoro and B. G. Franco (Northrop Aerosciences Laboratory, Hawthorne, CA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 87-93. 10 refs. (AIAA 82-0575)

The use of a choking valve in wind tunnel inlet-airframe models is described, along with the design of ejectors for augmentation in regulating higher weight flows and for upstream recovery conditions. The choking valve, with a plug insert, is operated by moving a plug in and out of the throat, and is calibrated for weight flow by use of Fliegner's isentropic formula for air. The ejectors are designed to produce the proper back pressure to choke the plug for all weight flows and conditions required. One-dimensional ejector theory is reviewed and determinations are made for the primary pressure, the primary weight flow, and the area ratio for the ejector system to pump a specified weight flow. An optimization process is outlined for fitting an ejector system to a choke valve, and experimental results are reported in regards the effects of the area ratio, mixing length, and the primary pressure ratio. M.S.K.

A82-24660 # **Technical innovations in testing and analysis of heat and pressure models in hypersonic wind tunnels.** H. R.

Carroll (Martin Marietta Aerospace, Denver, CO). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 94-100. 7 refs. (AIAA 82-0578)

Wind tunnel testing and analysis techniques for more cost-effective studies on projects using pressure and heat models to obtain flowfield and aerothermodynamic data in hypersonic flows are presented. Timed photographs were taken of paint melting off the nose of an MX missile model, with the paint actually an emulsified wax which retained the protuberance flow patterns when the test was terminated. Thin skin steel 0.030 in. thick was used on the cone and conic body instrumented with thermocouples and connected to a 260 channel multiplexor for data collection of millivolt output in response to heating and pressure changes due to unsteady shocks and laminar or turbulent flow. Temperature recovery methods in supersonic tunnels are discussed, along with tripping turbulent flow by means of twisted wires. Entropy measurements were accomplished by combining heating and pressure test results, Schlieren photographs, pressure rake data, and earlier data. M.S.K.

A82-24661 # **Slotted wall test section for automotive aerodynamic test facilities.** S. Raimondo and P. J. F. Clark (DSMA International, Inc., Toronto, Canada). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 101-109. 7 refs. (AIAA 82-0585)

The use of slotted walled test sections for automotive facilities was experimentally investigated. The experiments were performed at 1/5-scale, with two test section sizes which correspond to 11 sq m and 8.5 sq m equivalent full-scale facilities. For the vehicle used, the model blockages tested were 16.4 and 21.4% respectively. Among the parameters varied were the slot open-area ratio, the axial position of model within the test section and the amount of plenum flow diverted directly into the test section diffuser. The results obtained will be important to the design of small auto-aero facilities, and showed that accurate model pressure distribution data which do not require blockage corrections can be achieved for both test sections. The importance of properly controlling plenum flow at the downstream end of the test section was evident from the present tests. (Author)

A82-24663 * # **Transonic wind tunnel wall interference corrections for three-dimensional models.** M. H. Rizk (Flow Research Co., Kent, WA), M. Hafez (Flow Research Co., Kent, WA; George Washington University, Washington, DC), E. M. Murman (Flow Research Co., Kent, WA; MIT, Cambridge, MA), and D. Lovell (NASA, Langley Research Center, Hampton, VA; Flow Research Co., Kent, WA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 120-130. 21 refs. Contract No. NAS1-16262. (AIAA 82-0588)

A procedure for the evaluation of wall interference corrections for three-dimensional models is presented. The Mach number and angle-of-attack corrections require the numerical solution of the potential equation about a simplified representation of the experimental model. Pressure measurements are required near the wind tunnel walls. The correction procedure also requires knowledge of the free-stream Mach number, the model angle of attack, and the lift force experienced by the model. The procedure provides an estimate of the accuracy of the correction. For slender configurations at Mach numbers close to one, the Equivalence Rule formulation is adopted to calculate the wall interference effects. Preliminary results are presented for both general and slender-body configurations. (Author)

A82-24668 # **Review of support interference in dynamic tests.** L. E. Ericsson and J. P. Reding (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 166-190. 79 refs. (AIAA 82-0594)

A review of existing information about support interference has revealed that the support interference effects are much more severe in dynamic than in static tests. Furthermore, the support interference is aggravated greatly by a boat-tail or dome shaped base, even by modest base shoulder roundness, from what it is for a flat-based model. The general conclusion is that asymmetric stings or sting-strut combinations should be avoided. For slender bodies at low angles of attack a transverse rod comes close to permitting the true dynamically destabilizing effect of a bulbous base to be measured whereas even a very slender sting will distort the near wake effect and produce an unconservatively high measure of the dynamic stability. At intermediate and high angles of attack the sting support is superior to the other support methods, the transverse rod or the strut mounting. In many cases half-model testing provides the means to avoid most of the support interference effects. In some cases, as for a short blunt body such as the Viking configuration, the best approach appears to be to allow sting plunging, using a very slender sting. (Author)

A82-24669 # **The use of a multi-degree-of-freedom dual balance system to measure cross and cross-coupling derivatives.** D. R. Haberman (Calspan Field Services, Inc., Arnold Air Force Station, TN). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 191-201. 6 refs. (AIAA 82-0595)

Equations of motion and a data reduction method are presented for a dual balance system for measuring dynamic cross and cross-coupling derivatives for aerodynamic models in wind tunnel tests. The balances each weigh 1500 lb, with one to provide forced oscillation, pitch/yaw, and cross flexure as a motion generator, and the other to create pitch/yaw, or roll planes as a load measuring device. Both balances are noted to be similar to a five-component static force balance, and balance deflections are measured by holographic interferometry. The Lagrange method is used to derive the equation of motion in roll, and locations of the center of gravity are calculated from the known balance dimensions. Balance measurements are converted into a force and a moment about a selected reference point by substituting the measured load vectors into the static balance equation. Further consideration is given to roll data reduction and the correction of existing roll data. M.S.K.

A82-24670 # **Cross and cross-coupling derivative measurements on the standard dynamics model at AEDC.** S. M. Coulter and E. J. Marquart (Calspan Field Services, Inc., Arnold Air Force Station, TN). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 202-214. 9 refs. (AIAA 82-0596)

A description of newly developed pitch, yaw, and roll forced-oscillation balance systems is presented. These systems were designed with a particular goal of obtaining cross and cross-coupling derivative measurements at high angles of attack. Results of laboratory and wind tunnel tests (from Mach 0.3 to 1.3) are discussed. Cross and cross-coupling derivatives, direct dynamic, and static data, obtained from testing the Standard Dynamics Model (SDM) are shown for several test conditions. Comparisons to a previously obtained dynamic and static data base for this model show good agreement, verifying the accuracy of the measured parameters. (Author)

A82-24673 # **Development of a self-optimizing flexible technology /SOFT/ transonic wing wind tunnel model.** A. A. McClain and S. Pountney (General Dynamics Corp., Convair Div., San Diego, CA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 230-238. Contract No. N00014-76-C-0742. (AIAA 82-0601)

The SOFT-wing concept automatically adapts the wing shape through computer control. Designing the model to meet the criteria of transonic testing required the investigation and application of innovative techniques. Major design and fabrication features of the model included rectangular hydraulic actuators machined integrally in the spar, highly accurate linear potentiometers, leading- and trailing-edge skins of composite materials, a leading-edge extension mechanism, flexible wing tips, and a self-trimming horizontal stabilizer. It was concluded that an automated model is expensive to

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 418 reports, journal articles, and other documents originally announced in May 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

An annual cumulative index will be published.

A82-24005 # **Maintenance objectives for future aircraft.** J. G. Borger. *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 8 p.

Maintenance requirements for airline operations are discussed, noting the need for simpler designs which enhance maintenance procedures while still maintaining increasing fuel efficiency. Equipment redundancy is useful for safe operation with failed components, and modularizing aircraft parts has permitted on-line monitoring and replacement operations to maintain aircraft in flight-ready status with minimum delays due to repairs. The advent of advanced electronics has enhanced maintenance procedures in some cases, while in others the complexity of the monitoring system has led to greater down time. Higher performance engines degrade in performance after little more than a year's use, but refurbishment guided by high test stand acceptance standards, has improved engine removal rates. Finally, designing for reliability, ease of inspection and removal, and for in-flight potential problem indication are recommended. M.S.K.

A82-24006 # **Airworthiness regulation: What is our strategy - What are the issues.** M. C. Beard (FAA, Office of Airworthiness, Washington, DC). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 6 p.

The importance of international standards in the design, manufacture, and maintenance is stressed in view of the increase of the leasing, charter, and exchange of aircraft across national boundaries. Another trend noted in calling for international standards is the fact that the components of any given aircraft are, to an increasing extent, designed and manufactured in several different countries. C.R.

A82-24007 **Reliable power.** J. M. S. Keen (Rolls-Royce, Ltd., Derby, England). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 20 p.

Current Rolls-Royce engines are reviewed, with specific attention given to the implementation of a three-shaft concept for the modular development of engine thrust increases and fuel consumption decreases. The RB-211 three-shaft concept is reviewed, noting the development followed design goals of a short rigid engine with a minimum number of variables and cooled turbine stages. The E-4 engine employs a wide chord fan blade without snubbers and blends the turbine and bypass duct exhaust flows for passage through a single, final nozzle. Comprehensive access ports have been designed into the big fan engines, along with chip detectors in the oil system and vibration monitoring equipment for on-condition maintenance. Reliability management has resulted in the modular nature of the engines, featuring engine breakdown into separate, self-contained components, with comprehensive use records serving to notify when specific parts are due for inspection or replacement. M.S.K.

A82-24008 # **What the operator wants.** J. Meline. *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 6 p.

The design and manufacturing goals of aerospace industries for supplying airlines which have formed cooperative pools of maintenance and overhaul facilities and resources are examined. The manufacturers have gained feedback from the pooled labor forces who work on the increasingly standardized stocks of components in the common repair facilities, and are enabled to design-in improved features allowing easier and more thorough maintenance. Introduction of a new aircraft in any one fleet immediately introduces the vehicle to all maintenance personnel in the pool. The ATLAS group is noted to currently maintain a total fleet of 437 aircraft, and member agencies coordinate shared time to meet overhaul requirements. Differences in on-condition maintenance and overhaul grouping of work is described, and the benefits of pooling the most qualified personnel are emphasized. M.S.K.

A82-24009 # **The way ahead for helicopter maintenance.** W. E. Morris (Westland Helicopters, Ltd., Yeovil, Somerset, England). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 9 p.

The progress made by a British helicopter company in improving maintainability and reliability (M & R) is surveyed. Among the practices that have been found to be significant are the following: (1) maintaining a comprehensive data bank on M & R that is linked with customer data banks; (2) mathematical modeling of the life cycle costs; (3) improving the ability to diagnose sources of vibration without detriment to the operational availability of the helicopter; and (4) introducing check out systems that record in-flight defects and malfunctions, thereby simplifying maintenance programming. C.R.

A82-24010 # **The inter-relation between design, construction and maintenance.** J. M. Ramsden. *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 5 p.

Methods of improving inspection and maintenance procedures, especially to compensate for an emphasized rise in poor workmanship during construction phases, are outlined. An improvement in detail design, to simplify and correctly place aircraft components, is recommended, as is better education of specialists in features of fasteners and electronics. On-line monitoring has become possible with self-checking, multiple probes for nearly all functional on-board equipment. The need to improve tires and brake systems to cope with increasing landing weights and speeds is noted, as is a necessity to integrate electronic systems and provide protection from disconnects due to the operating environment. Further suggestions are made for the elimination of corrosion, improvements in inspectability, and the need to measure in-service aerodynamics, and the demise of the U.S. Civil Aeronautics Board is mentioned as an erosion of the airline industry's data base. M.S.K.

A82-24011 # **MSG-3 structures.** S. Schofield (British Airways, Hounslow, Middx., England). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 5 p.

The paper describes the philosophy and methodology used to develop the aircraft structures maintenance program contained and recently published in the ATA Airline/Manufacturer Maintenance Program Planning Document MSG-3. Particular consideration is given to the evolution of a separate logic analysis for structures; the consequence of failure evaluation; the separate assessment of the different forms of structural damage; the detectability of damage; the establishment of a continuing structural program for the life of the aircraft; fleet leader/age exploration inspections and the role of the manufacturer in the continuing structure program. B.J.

A82-24012 # **Monitoring engine wear by oil analysis.** D. F. Sermin (Applied Research Laboratories of Florida, Inc., Hialeah, FL). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 5 p.

The application of spectroscopic techniques to the detection of metal particles in engine oils as an identifier and predictor of specific component wear and incipient failure is described. The current rotrode technique involves physically taking an oil sample for electrical discharge vaporization and subsequent spectrography. A succeeding step identifies the concentration computer calibrated graph. Inaccuracies in the method had led to the development of wear element contraction determination by the use of inductively coupled plasma excitation. The sample is introduced to the plasma within a quartz tube surrounded by a coil of wire which creates the magnetic field. The oil is nebulized and passed through a tube into the plasma, where the atoms dissociate and create individual optical spectra in the 7000-10,000 K heat. The method yields results within 1% of the signal value detected, or within 1 ppm. M.S.K.

A82-24014 # **MSG-3 overview.** R. Valeika (Pan American World Airways, Inc., New York, NY). *International Aircraft Maintenance Engineering Exhibition and Conference, Zurich, Switzerland, Feb. 10-12, 1981, Paper.* 4 p.

The paper surveys experience with programs developed in the framework of the ATA Airline/Manufacturer Maintenance Program Planning Document MSG-3. After a brief review of experience with MSG-1/2, attention is given to MSG-3 development, and to maintenance programs developed for systems, powerplants, and structures within the MSG-3 context. B.J.

A82-24022 * # **Minimum mass sizing of a large low-aspect ratio airframe for flutter-free performance.** W. H. Greene and J. Sobieszczanski-Sobieski (NASA, Langley Research Center, Hampton, VA). *(AIAA, ASME, ASCE, and AHS, Structures, Structural Dynamics and Materials Conference, 21st, Seattle, WA, May 12-14, 1980, AIAA Paper 80-0724.) Journal of Aircraft*, vol. 19, Mar. 1982, p. 228-234. 12 refs.

A procedure for sizing an airframe for flutter-free performance is demonstrated on a large, flexible supersonic transport aircraft. The procedure is based on using a two-level reduced basis or modal technique for reducing the computational cost of performing the repetitive flutter analyses. The supersonic transport aircraft exhibits complex dynamic behavior, has a well-known flutter problem and requires a large finite-element model to predict the vibratory and flutter response. Flutter-free designs are produced with small mass increases relative to the wing structural weight and aircraft payload. In view of the ability of the resizing procedure to handle this supersonic transport configuration, it seems likely that the method could be used for many other aircraft. (Author)

A82-24023 # **Static pressure in the slipstream of a propeller.** G. Schouten (Delft, Technische Hogeschool, Delft, Netherlands). *Journal of Aircraft*, vol. 19, Mar. 1982, p. 251-253. 9 refs.

Prompted by the paradoxical implication of existing theory that static pressure in the slipstream of an active propeller would exceed the static pressure in the fluid outside the slipstream, a consistent theory is developed which yields a static pressure more plausibly tending to the freestream pressure. The theory adapts the flat trailing vortex sheet model to a propeller with a finite number of blades which moves at a finite velocity. O.C.

A82-24025 **Air transport in the 21st century.** K. G. Wilkinson. *Aerospace* (UK), vol. 9, Jan. 1982, p. 18-23. 8 refs.

Trends in aircraft design into the 21st century are discussed, based on the driving need for higher fuel efficiency and alternative fuels. Noting that fuel presently accounts for 30% of air transportation, results of an international study on the world energy supply and growth are used to present several scenarios of future aerospace operations. Global energy is projected to be provided from renewables and nuclear, coal and gas, and oil, each group producing 1/3 of the world energy demands, with aerospace consuming 3% of the total oil consumed. Advances in aerodynamics from NASA studies, in lightweight synthetic materials, in active controls, and in propulsion systems are outlined, with mention made of the CO2 contribution to a global rise in temperature. The development of nuclear technology and the availability of nuclear fuels is contrasted against the environmental costs of using hydrocarbon fuels, and the necessity of developing a hydrogen-based fuel economy is emphasized. M.S.K.

A82-24065 **Navigational aids on-board the Concorde (Les moyens de navigation du Concorde).** F. Vicens (Compagnie Nationale Air France, Paris, France). *Navigation (Paris)*, vol. 30, Jan. 1982, p. 25-39. In French.

The differences of navigational instrumentation on the Concorde from subsonic aircraft due to transonic and supersonic flight regimes are described. Speed classes at different heights are defined for optimal flight operations, with each minute of error from the most direct route causing an extra 100 kg of fuel to be consumed. The Concorde is equipped with an inertial navigation system (INS), automatic direction finder, distance measuring equipment, VOR, and a ground warning system. The INS gathers altitude information, guidance and navigation data, and coupled compass stabilization information with reference to the magnetic pole. The Air Data Computer gathers aerodynamic and meteorological information, including altitude and vertical airspeed, from sensors mounted on the nose, and further guidance is aided by radio compass readings (Automatic Directional Finder) and two systems of radio altimetry. M.S.K.

A82-24066 **The birth of precision DME (La naissance du DME de précision).** O. Carel (Direction Générale à l'Aviation Civile, Paris, France). *Navigation (Paris)*, vol. 30, Jan. 1982, p. 53-65. 6 refs. In French.

The requirements, design, and deployment of precision distance measuring equipment (DME) for implementation at French civil airports is described. The system is intended to equal the performance levels of military landing systems, and furnish coordinates at 20 nm distance with a landing aperture of plus or minus 80 deg. The DME permits curved approaches, thereby ameliorating flights over some urban areas, and offers the possibility of totally replacing radioaltimetry as an approach guide. Polar coordinates are transmitted with an accuracy of 250 m, which is matched by the transverse accuracy, while altimeter readings are made with a 30 m error. Methods of obtaining the precision measurements are presented, along with analyses of exponential damping, fabrication of the system, the presence of second or third impulses, and methods of interlocking the impulses, along with a demonstration of a 200 channel dual mode system. M.S.K.

A82-24077 # **Recent developments in wing with stores flutter suppression.** R. Destuynder (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Deutsche Gesellschaft für Luft- und Raumfahrt and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Aeroelasticity, Nuremberg, West Germany, Oct. 5-7, 1981.) ONERA, TP* no. 1981-145, 1981. 11 p.

Active flutter suppression calculations and wind tunnel tests were performed for the case of a half-scale model of the Mirage F-1 fighter wing, equipped with three underwing stores whose distribution has been modified to make flutter occur in the wind tunnel's Mach 0.80-0.94 transonic regime. Flutter control was achieved with a numerical control law designed to induce wing aerodynamic stiffness by means of a control surface. Further studies were conducted on nonlinearities due to the static aerodynamic characteristics of the control surface at high subsonic Mach numbers, and the influence of phase and gain variations on the control law. The results derived demonstrate the possibility of flutter control on military aircraft operating at high Mach numbers. O.C.

A82-24245 **Recent improvements in aircraft Ni-Cd cells.** R. Bonnaterre, J. Leonardi, and P. Oliva (Société des Accumulateurs Fixes et de Traction, Bordeaux, France). In: Power sources 8: Research and development in non-mechanical electrical power sources; Proceedings of the Twelfth International Symposium, Brighton, England, September 1980. London, Academic Press, 1981, p. 459-468; Discussion, p. 469.

It is noted that the reliability, power performance, and durability of the alkaline Ni-Cd batteries used in such advanced technical fields as aeronautics and high-speed trains are becoming increasingly important. A new aircraft battery generation created to respond to such requirements is described. Increased reliability and durability result from the development and use of a new graft copolymer membrane, the properties of which are discussed. The use of the new membrane and the optimization of the electromechanical parameters of the cell design have significantly improved the power characteristics of Ni-Cd aircraft batteries. In particular, eliminating the 'potential well' phenomenon in low-temperature, high-rate discharges has led to substantial power gains for low-temperature aircraft starts. C.R.

A82-24301 **Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings.** Conference sponsored by the Society of British Aerospace Companies. London, Society of British Aerospace Companies, Ltd., 1981. 713 p. $59.50.

Among the aircraft transparency design, testing and analysis topics covered are: (1) transparency development needs for military aircraft in the 1980s, (2) an aircraft transparency design guide, (3) deficiencies and constraints affecting the design of cockpit transparencies and enclosures, (4) bird strikes, (5) windshield system structural enhancement, (6) aircraft transparency bird impact analysis using the MAGNA computer program, (7) stretched acrylic transparency materials, (8) transport aircraft transparencies, and (9) impact resistance test methods. Also considered are (10) abrasion-resistant coatings for aircraft, (11) the role of finite element analysis in the design of birdstrike-resistant transparencies, and (12) the effects of bird orientation on load profile and damage level. O.C.

A82-24302 **Transparency development needs for military aircraft in the 1980's.** N. C. Moore. In: Conference on Aerospace develop; however, its productivity reduces test costs significantly, thereby offsetting increased model costs. (Author)

A82-24674 * # **Structural modeling of high Reynolds number wind tunnel models.** S. C. Mehrotra (Vigyan Research Associates, Inc., Hampton, VA) and J. C. Robinson (NASA, Langley Research Center, Hampton, VA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 239-245. Contract No. NAS1-16114. (AIAA 82-0602)

A solid uninstrumented wing and a pressure instrumented wing having a tongue and groove type joint have been structurally modeled by using SPAR Structural Analysis System. The solid wing model can be analyzed by SPAR, using either solid elements or plate elements with reasonable accuracy. The instrumented wing models with tongue and groove joint can be modeled by using solid elements. A solid model representation for the wing with tongue and groove joint can be used for the cases where an error of 6 percent in deflections is acceptable. (Author)

A82-24675 * # **Evaluation of methods for characterizing surface topography of models for high Reynolds number wind-tunnels.** E. C. Teague, T. V. Vorburger, F. E. Scire, S. M. Baker, S. W. Jensen (National Bureau of Standards, Washington, DC), B. B. Gloss (NASA, Langley Research Center, Hampton, VA), and C. Trahan. In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 246-251. 6 refs. NASA Order L-4718-B. (AIAA 82-0603)

Current work by the National Bureau of Standards at the NASA National Transonic Facility (NTF) to evaluate the performance of stylus instruments for determining the topography of models under investigation is described along with instrumentation for characterization of the surface microtopography. Potential areas of surface effects are reviewed, and the need for finer surfaced models for the NTF high Reynolds number flows is stressed. Current stylus instruments have a radii as large as 25 microns, and three models with surface finishes of 4-6, 8-10, and 12-15 micro-in. rms surface finishes were fabricated for tests with a stylus with a tip radius of 1 micron and a 50 mg force. Work involving three-dimensional stylus profilometry is discussed in terms of stylus displacement being converted to digital signals, and the design of a light scattering instrument capable of measuring the surface finish on curved objects is presented. M.S.K.

A82-24676 * # **Status and capabilities of the National Full Scale Facility 40- by 80-foot wind tunnel modification.** K. W. Mort, D. F. Engelbert, and J. C. Dusterberry (NASA, Ames Research Center, Moffett Field, CA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 252-272. 30 refs. (AIAA 82-0607)

The background, requirements, and aerodynamic design of the modified NASA Ames 40 x 80 ft wind tunnel are reviewed, along with the systems integration and systems test results. Advancing vehicle sizes and airspeeds required a larger wind tunnel test section and a capability for 100 and 300 knots airspeed simulation. Acoustic mufflers at the inlet and exit of the nonreturn circuit provide noise suppression. The enlarged test section is intended to accomodate the complex flowfields of wings with high lift coefficients, and the drive system is designed with minimum residual swirl. Features of the fan blades are examined, along with characteristics of the test channels, control vanes and louvers, the exit, circuit losses, temperature rises during operation of the nonreturn circuit, and the facility acoustics. Specific construction problems and solutions for the conversion process are outlined, and it is noted that operational status is expected at the end of 1982. M.S.K.

A82-24677 * # **A new facility and technique for two-dimensional aerodynamic testing.** J. B. McDevitt, T. E. Polek, and L. A. Hand (NASA, Ames Research Center, Moffett Field, CA). In: Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 273-295. 6 refs. (AIAA 82-0608)

The design and operational characteristics of a new test leg for the High Reynolds Number Facility at Ames Research Center are presented, and the unique features of a test section for obtaining two-dimensional airfoil data are reviewed. The new facility operates at unit Reynolds numbers ranging from 1,000,000/ft to 30,000,000/ft. Boundary-layer suction panels are used in the test section (16 in. wide by 24 in. high) to minimize side-wall interference effects. Flexible, easily adjustable upper and lower walls allow test-channel area-ruling so as to nullify Mach-number changes induced by mass removal, to correct for longitudinal boundary-layer growth, and to provide contouring compatible with the streamlines of the model in free air. (Author)

A82-24701 **The Agusta's solution of AHS's hypothetical fatigue life problem.** G. Aldinio and P. Alli (Costruzioni Aeronautiche Giovanni Agusta S.p.A., Gallarate, Italy). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 15 p. 8 refs.

The Agusta solution to the American Helicopter Society's hypothetical fatigue life problem is presented. The fatigue analysis methodology for dynamic components is based on Miner's rule, which necessitates a proper load survey and some fatigue tests. The component's life is calculated using peak value flight loads, cycle-counted flight loads, the rainflow method, the range-pair-range method, and counting methods. GAG cycles are also discussed. D.L.G.

A82-24703 **The challenge of standardizing fatigue methodology.** B. Altman and J. Pratt (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 14 p. 7 refs.

The Sikorsky methodology is described, and the goal of standardization of fatigue methodology as applied to a hypothetical fatigue problem is discussed. Areas that can be successfully standardized include S/N curve shapes for specific materials, the use or non-use of Goodman corrections, the selection of test steady loads, and the determination of primary frequency. It is concluded that the success with which standardization will set the balance between structural reliability and program costs will depend upon the assessment of the risks involved for the total methodology; a system approach is needed to understand and optimize the risks involved in the total methodology selected and the program advantages. D.L.G.

A82-24704 **Standardization of helicopter fatigue methodology - A manufacturer's view.** J. M. Drees (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 11 p.

It is pointed out that each helicopter company has its own way of determining component lives. As the existence of such differences has created problems for the Army evaluation teams, it has been recommended that standardization of methods be imposed by the Army for future developments. The present investigation is concerned with the question of whether standardization beyond what has already been specified is beneficial from an overall standpoint. It is found that there are a number of aspects which make it difficult to recommend at the present time the introduction of new industry-wide standards. Thus, it appears unlikely that safety will be improved by such standards, because many field failures are caused by factors which are not part of the methodology presently followed. The recommendation is made that an independent 'Helicopter Fatigue Methodology Council' be formed. Feasibility of standardization may be explored as well as many other subjects of common interest during workshop-type meetings. G.R.

A82-24705 **Application of fatigue, crack propagation and strain survey testing to the CH-46 aft rotor drive shaft.** H. S. Faust (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 18 p.

A fatigue cracking problem in the aft rotor drive shaft of the CH-46 helicopter is described. The cracking occurred in a pinned joint between two sections of the shaft, at service times below the retirement life indicated by the original fatigue test and life calculations. Crack propagation and strain survey tests are discussed together with their use in defining periodic inspection intervals and joint improvements. In addition, a new stress analysis technique for joints of this type is introduced. (Author)

A82-24706 **Evolution of the Aeroscout.** G. Fossum, II (U.S. Army, Training and Doctrine Command, Fort Monroe, VA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 7 p.

The development of the aerial scout is discussed, taking into account medical evacuation roles assigned to the first helicopters purchased by the Army, the role of the helicopter during the Korean War, the scout/gunship role for the OH-13 helicopter, and scout missions performed in Vietnam. The adaption of helicopter scout tactics for modern combat conditions is considered, giving attention to the need to increase the helicopter's survivability on the mid to high intensity battlefield. The present concept of scout employment calls for the scout to be the integrator of aerial antiarmor firepower of the combined arms team. Four major roles identified are related to operations as air cavalry scout, attack helicopter scout, artillery scout, and an aid to battlefield management. G.R.

A82-24707 **Flight test data acquisition and interpretation.** C. Hutchinson and H. Steinmann (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 18 p.

Data acquisition comprises the selection of measurements, optimization of recording methods, and processing of the measurements for interpretation. Basic measurements are related to the determination of airspeed, altitude, gross weight, the center of gravity, rotor speed, outside air temperature, attitudes, rates, stick positions, and load factor. The complete list of the parameters is dependent on the type of helicopter being tested. However, the intent is to be able to verify the suitability of maneuvers for the flight load survey requirements. Data interpretation considers safety of the test aircraft, load studies, and fatigue life predictions. Variations in operating restrictions, based on fatigue loads, can have dramatic effects on the outcome of the fatigue life assessment. G.R.

A82-24708 **Structural testing of composites with known defects.** P. F. Maloney (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 14 p. 5 refs.

In connection with the application of composite materials in primary structural components of production aircraft, an understanding of the significance of typical defects in the material is very important. The present investigation has the objective to make a contribution to such an understanding. Specific experiences discussed are derived from four separate development programs of relatively recent completion. Attention is given to the composite main rotor blade for the AH-1 Cobra helicopter, the composite rotor hub development program, the composite main rotor blade for the circulation control rotor, and the development of a composite blade for a 300 foot diameter wind turbine. A description is presented of salient features of each of these programs, taking into account significant findings relative to defects as they may affect composite materials. G.R.

A82-24709 **A method of determining safe service life for helicopter components.** G. W. McCloud (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 12 p.

It is pointed out that the considered methods have been used by an American helicopter manufacturer for many years and were found to be reliable. In general, these methods follow those outlined in FAA Advisory Circular 20-95. The information required for the determination of the fatigue life of a component includes the fatigue strength characteristics of the component, the stresses associated with normal flight maneuvers, and the frequency of occurrence of those maneuvers. Attention is given to the approaches employed to obtain information regarding the fatigue strength, the operating loads spectrum, a fatigue life calculation, and prospects for improving state-of-the-art procedures. G.R.

A82-24710 **Hughes helicopters - Fatigue life methodology.** J. McDermott (Hughes Helicopters, Inc., Culver City, CA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 20 p.

A description is presented of the approach used by an American helicopter manufacturer in solving a hypothetical fatigue problem. The solution of the problem was undertaken to identify and evaluate the different methodologies existing in the industry. The hypothetical fatigue problem provides loads data, fatigue test data, and defines the spectrum. The required solutions include the calculation of fatigue life using cycle counted data, the calculation of fatigue life using peak loads applied throughout the time slice of duration of maneuver, and the determination of the effect of GAG cycles. The results of the investigation show the importance of the determination of the S-N curve, using either best data fit or standard material curve shape. Assumption of peak cycle loads for duration of maneuver is found to be ultra conservative, leaving out the GAG cycle is unconservative. G.R.

A82-24712 **Flight condition recognition /FCR/ technique.** D. M. Saylor (U.S. Army, Research and Technology Laboratories, Fort Eustis, VA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 7 p.

A U.S. Army contract, entitled 'Structural Integrity Monitoring System' was performed to design, qualify, flight test, and demonstrate the Structural Integrity Recording System (SIRS). SIRS provides a cost-effective method of tracking the accumulation of fatigue damage on critical helicopter dynamic components. The system monitors the variations in fleet utilization on a helicopter-by-helicopter basis for safer and more economical operation. SIRS is a total system comprising an airborne microprocessor-based recorder, a portable flight-line retrieval unit, and a data processing package. Attention is given to the airborne recorder, the transducer package, the retrieval unit, fatigue damage assessment software, flight test programs, aspects of operational test and evaluation, and a flight test program. G.R.

A82-24713 **NDE of composite rotor blades during fatigue testing.** R. Shuford, W. Houghton (U.S. Army, Army Materials and Mechanics Research Center, Watertown, MA), J. R. Mitchell (Becton, Dickinson and Co., Dunegan-Endevco, San Juan Capistrano, CA), and J. W. Sobczak (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 17 p. 11 refs.

A description is presented of progress made in a continuing project concerned with the evaluation of the usefulness of several nondestructive evaluation (NDE) techniques for monitoring flaw initation and growth in composite helicopter rotor blades. The acoustic emission (AE) results indicate minor fatigued damage. It appears, therefore, feasible to project an AE failure curve based on the emissions from periodic proof overloads. This technique could have wide application in new product certification and in-service inspection of composite rotor blades. Indications from the vibrothermography portion of the program suggest that it may provide an excellent method for locating, characterizing, and understanding defect development and growth during cyclic loading of composite structures. Results from the ultrasonic, radiographic and visual examinations indicate that these procedures are very useful for the evaluation of defects in composite rotor blades. G.R.

A82-24714 **Fundamentals of helicopter fatigue life determination.** D. P. Schrage (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 28 p. 10 refs.

This paper reviews the fundamentals of helicopter fatigue life determination by discussing the sources and definitions of helicopter loads, the relationships between these loads and critical stresses, and helicopter fatigue methodology. Helicopter fatigue methodology is the process by which the various aspects and disciplines are incorporated into a procedure for calculating helicopter fatigue lives. (Author)

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Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 3-13.

Attention is given to the improvement and optimization of overall transparency configurations in military aircraft. A number of areas for development effort are identified. These include (1) the achievement of undistorted views from helicopter transparencies, (2) the need for distortionless, near-360-deg vision from fixed wing strike aircraft windscreens and canopies, (3) the reduction of transparency-induced cockpit noise, (4) the lowering of glint phenomena through transparency surface reflectivity reduction, (5) the design of alternative windscreen washers and wipers, (6) the reduction of strike aircraft combat losses due to pilot injury, by means of transparent armor, (7) emergency repair schemes under battle conditions, and (8) nuclear effects due to overpressure, flash and thermal effects, and radiation levels. O.C.

A82-24303 **Deficiencies and constraints that affect the design of cockpit enclosures and transparencies.** J. H. Lawrence, Jr. (Douglas Aircraft Co., Long Beach, CA). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 15-24.

Maximum-visibility cockpit enclosure and transparency design problems are considered in light of experience with the development of the DC-10, in which these design considerations were addressed by means of a systems approach. The strongest constraint is shown to be the aerodynamic shaping of the aircraft, which, because of the slopes and shapes required, may be unacceptable to the pilot on the grounds of distortion and can increase the difficulty of designing such subsystems as the electrical, anti-icing, and rain removal. Attention is also given the inadequacies of glass-acrylic laminates under cyclic loading, thermal cycling and contact with moisture, the seals and mounting of the transparencies in their support structures, and up/down-left/right charts for both minimum recommended vision and the captain's binocular vision envelope. O.C.

A82-24304 **Fuel-efficient windshields for transport, commuter and business aircraft.** G. L. Wiser (Sierracin Corp., Sylmar, CA). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 25-95. 34 refs.

The effects of weight and drag reduction measures involving windshields and their associated structures and systems on fuel efficiency are explored. It is shown that the incorporation of these techniques can save up to 80,000 gallons of fuel/year per aircraft in wide-body commercial aircraft applications, and 12,000 gallons/year per aircraft in the case of commuter designs. The alternatives considered include (1) flat glass windshields, (2) curved glass windshields, (3) curved high-strength glass windshields, (4) structurally-integrated curved windshields, (5) curved stretched acrylic windshields, (6) curved, chemically-strengthened glass windshields, and such associated systems as temperature controllers and rain removal. O.C.

A82-24305 **Transparencies - What an aircraft designer should know.** P. J. Sharp (Lucas Aerospace, Ltd., Luton, Beds., England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 97-111.

The effect of windscreen lay-back angle on aircraft weight, energy requirements and optical characteristics are quantified for a typical, small jet aircraft, and the problems associated with the electrical deicing of irregular areas are examined. Weight effects are due to the load-transfer requirements of pressurized cabin transparencies. Additional factors considered are bird strikes, windscreen visual distortion, heating element positioning, and certification criteria. O.C.

A82-24306 **Transparency design decisions - Assessing their impact on visual performance.** R. G. Eggleston and L. V. Genco (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 113-128.

The efficiency of aircraft transparency designs is considered as an information system in which the scene, transparency and pilot are separate elements. A transparency may alter the scene visible to a pilot in four ways: refraction, reflection, absorption and transmission. These are the bases for such common transparency optical degradation problems as (1) distortion, (2) multiple imaging, (3) rainbowing, (4) volume and surface haze, (5) internal reflections, and (6) transmission loss. The contribution to each of these defects by transparency slant, flatness, single or compound curvature, material, thickness, absorption characteristics, scratch resistance, UV resistance, and monolithic or laminated construction, are correlated in tabular form along with observer and scene factors that may contribute to the quality or degradation of performance. O.C.

A82-24307 **Aircraft transparency design guide.** L. Moosman (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH) and J. H. Lawrence, Jr. (Douglas Aircraft Co., Long Beach, CA). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 129-139.

The 'Guidelines for the Design of Aircraft Windshield/Canopy Systems' is a design manual which serves as a single source for all requirements, data and systems recommendations relevant to the development of aircraft transparencies. The guide covers: (1) management of transparencies and related subsystems design; (2) the transparency/aircraft configuration relationship, (3) vision and optical design; (4) structural design and analysis; (5) bird impacts; (6) materials; (7) environmental design; (8) combat exposure design; (9) maintainability; (10) reliability; and (11) transparency design verification and quality assurance requirements. The data from which this compilation of requirements was derived include FAR 25, SAE AS580, and the Air Force Systems Command Design Handbook. O.C.

A82-24308 **A new angular deviation measurement device for aircraft transparencies.** H. L. Task, R. G. Eggleston, and L. V. Genco (USAF, Human Engineering Div., Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 141-147.

An optoelectronic angular deviation measurement device incorporating a CCD array, which offers accuracy, repeatability and ease of operation while occupying a much smaller volume than long-throw laser devices of comparable performance, is described. The instrument's resolution is 0.07 mrad, and F-16 windscreen measurements have been found to compare favorably with data produced by alternative techniques. The device is to be used in characterizing distortion levels in such transparency-incorporating systems as head-up displays. O.C.

A82-24309 **Portable transparency optical test system /P-TOTS/.** L. V. Genco, R. G. Eggleston, and H. L. Task (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England), September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 149-160.

The Portable Transparency Optical Test System (P-TOTS) described is a novel device for the collection of visual and optical data from installed transparencies, including the evaluation of time-dependent changes in optical quality. Although P-TOTS has to date been employed in the birefringence, distortion, binocular distortion, multiple image and haze characterization of F-111 windscreens, the device may be adapted to other aircraft through a mounting-fixture change estimated to cost $4000. O.C.

A82-24310 **Abrasion resistant coated plastic products for aircraft.** W. F. Fischer and W. C. Harbison (Swedlow, Inc., Garden Grove, CA). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 185-204. 10 refs.

Experimental results concerning the use of the application of abrasion-resistant coatings to polycarbonate and acrylic transparencies in architectural and ground-transportation installations are correlated to the use of such coatings on aircraft transparencies. A failure theory is substantiated through a combination of the experimental data with separate results of accelerated testing. A silica-filled polysiloxane coating is shown to offer the greatest resistance to abrasion. The failure mode of the coatings is generally mechanical degradation, consisting of cracking or microcracking from repeated tensile elongation/compression associated with thermal, moisture gain/loss and flexural cycling. O.C.

A82-24311 **Proposed method for abrasion testing transparent plastics and coatings.** A. J. Bunje (Texstar Corp., Texstar Plastics, Grand Prairie, TX). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 205-213.

An examination is presented of methods for the abrasion testing of transparent plastics and coatings, with attention to the preparation and interpretation of the Taber Abraser and Falling Sand tests. A test methodology is described which allows the testing of all materials and coatings irrespective of hardness, and in which the entire sample surface is exposed to the abrading action. The larger area thereby measured yields more representative results, which are shown to be highly reproducible. Test results data are presented in tabular form. O.C.

A82-24312 **Windshield system structural enhancement.** R. J. Speelman, R. H. Walker, and R. L. Peterson (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 217-243. 22 refs.

Transparency technology investigations with emphases on improved birdstrike resistance and longer service life are being conducted by the Air Force Flight Dynamics Laboratory. In addition to supporting such existing systems as the T-38, F-16 and F-111, a technical base is emerging for the development of new transparencies which includes: (1) computer-aided design procedures for birdstrike structural analysis; (2) birdstrike hazard risk prediction techniques; (3) design procedures for the integration of birdstrike protection and large field-of-view capabilities with high-temperature operation; (4) design procedures for consideration of ballistic fragment impact resistance; (5) testing procedures for improved correlation between laboratory and field performance; and (6) a transparency system design-guideline manual. O.C.

A82-24313 # **An analytical methodology to predict potential aircraft losses due to canopy birdstrikes.** J. C. Halpin, J. M. Griffin, and K. T. Jackson, Jr. (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 245-271.

An analysis for the projection of birdstrike damage is presented in which data for the F-4 aircraft is used as a basis for the development of a model and the F-16 is used for verification. After determining the operational impact rate (OIR), a kinetic energy matrix is calculated and a line representing the expected canopy capability is drawn through this matrix. The canopy capability line from the kinetic energy matrix is then superposed on the birdstrike matrix, and the birdstrike number is derived by summing the appropriate values from the matrix. If the failure mode is deflection rather than penetration, critical areas corresponding to certain kinetic energy levels must be determined and then used to recalculate the expected birdstrike matrix. O.C.

A82-24314 **The role of finite element analysis in the design of birdstrike resistant transparencies.** B. S. West (Dayton, University, Dayton, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 273-295. 8 refs. Contracts No. F33615-75-C-3134; No. F33615-76-C-3103; No. F33615-80-C-3401.

The Materially and Geometrically Nonlinear dynamics Analysis problems (MAGNA) finite element code, for the efficient analysis of crew enclosure structures during bird impact, is described. The design variables typically incorporated into parametric design data in the code are: (1) transparency stiffness, which depends on material, configuration and thickness; (2) support structure stiffness; (3) load location; (4) load magnitude; and (5) edge member configuration. Transparency edge member integrity has proved to be critical to the birdstrike resistance of aircraft transparency/support systems. Computer run time increases by more than an order of magnitude if the parametric study is conducted using all available nonlinear options rather than linear elastic analysis. Several sample analyses are presented to demonstrate the linear and nonlinear solution capabilities of the MAGNA program. O.C.

A82-24315 **Aircraft transparency bird impact analysis using the MAGNA computer program.** R. E. McCarty (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 297-313. 14 refs.

The MAGNA computer program is shown to realistically simulate the nonlinear dynamic structural response of aircraft transparencies to birdstrike loading. It is not yet possible, however, to accurately predetermine the loads resulting from bird impact on very flexible transparencies, due to the fact that the magnitude of the loads and the surface area and time period over which they act strongly depend on the dynamic response of the transparency. MAGNA is especially applicable to relatively stiff transparencies, in which the effects of load-response coupling may be ignored, and may prove useful in the analysis of any problem involving the response of a structure subject to static or transient loads. O.C.

A82-24316 **The effects of bird orientation on load profile and damage level.** A. Challita and B. S. West (Dayton, University, Dayton, OH). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 315-338. 7 refs. Contract No. F33615-78-C-3402.

A number of programs have been initiated with the aim to increase the birdstrike resistance of aircraft and their components. A description is presented of specific programs with two basic objectives. One objective is related to a characterization of the loads generated during birdstrike to use as input to the modern finite element structural analysis codes which are currently used as a transparency design tool. The second objective involves the evaluation of the testing procedures employed to evaluate the level of birdstrike protection afforded by a given flight hardware system. Of three orientations tested, end-on orientation was found to be as critical, or more critical, than the other orientations. Side-on orientation was the least critical orientation. During end-on birdstrike testing, pitch and yaw would tend to decrease critically. G.R.

A82-24317 **Acrylic - A timely review.** K. G. Granger (Swedlow, Inc., Garden Grove, CA). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings. London, Society of British Aerospace Companies, Ltd., 1981, p. 341-354, 356, 357.

The review is concerned with the use of acrylics in applications related to aircraft transparencies, taking into account the principal aircraft grades of acrylic. Main qualities of acrylics with respect to the considered applications include its ability to maintain excellent strength, transparency, and clarity in environments which comparatively quickly cause deterioration in other transparent plastics. For aircraft glazings applications, only glass is superior to acrylic in terms of weatherability, solvent resistance, and surface hardness. However, glass is inferior to plastics in connection with greater weight, failure mode, and relative difficulties with respect to the formation of aerodynamic shapes. A number of case histories are discussed which demonstrate the advantages of a use of acrylic. Attention is also given to the proposed laminated F-16 canopy design and the development of modified acrylics. G.R.

A82-24318 **Lucas stretched acrylic.** D. B. Bell (Lucas Aerospace, Ltd., Luton, Beds., England). In: Conference on Aerospace Transparencies, London, England, September 8-10, 1980,

A82-24715 **Fatigue test of the typical main rotor controls component.** J. Slack and J. Cernosek (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 17 p.

The general procedure used to qualify a fatigue critical component is illustrated with the aid of a flow chart. The decision regarding the condition of fatigue tests for a particular component is made as soon as practical in a program. The decision takes into consideration the expected fatigue environment on the helicopter. An early diagnosis of potential component fatigue problems is important to prevent certification delays, and costly manufacturing charge requirements. Considerations of the plan of test are discussed, giving attention to the test specimen, the type of test, the test loads, and the test machine. The more important aspects concerning the implementation of the test plan are related to the test set up, the failure analysis, and the feedback requirements. G.R.

A82-24716 **Hypothetical fatigue life problem - Application of Aérospatiale method.** G. Stievenard (Société Nationale Industrielle Aérospatiale, Division Hélicoptères, Marignane, Bouches-du-Rhône, France). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 34 p.

The mean fatigue curve calculation is considered, taking into account the permissible alternating load and the plotting of the unit Wöhler curve. The Wöhler curve makes it possible to calculate, from test results, a mean fatigue curve and a standard deviation representative of the scatter. Attention is given to safe fatigue curve calculation, aspects of flight load determination, the fatigue life calculation using peak value flight loads, a fatigue life calculation using cycle-counted flight loads, and the values for a G.A.G. cycle. It is pointed out that the Wöhler curves for steels loaded without fretting are generally flat and that this results in very high difference in the number of cycles for low variations of loading. G.R.

A82-24717 **The cargo helicopter - A logistical vehicle.** R. L. Stoessner and R. C. Heehn (U.S. Army, Training and Doctrine Command, Fort Monroe, VA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 13 p. 9 refs.

The availability of adequate supplies is a crucial factor for an army engaged in a battle. In the case of highly mobile forces involved in other than light assault missions, supply requirements combined with the factor of time sensitivity dictate the use of air logistics helicopters. The logistical helicopters are considered an integral part of the support command's transportation service. Attention is given to the employment of air transport units providing combat service support from a logistical base to a combat force such as a division or brigade which is operating in an underdeveloped area. The Tactical Mobility Requirements Board report of 1962, laid the foundation for true airmobility of Army Forces. The versatility of the cargo helicopter was demonstrated in Vietnam. However, much of the operational experience gained is not applicable to a mid- or high-intensity combat environment. The air defense threat envelope will require the cargo helicopter to utilize terrain masking to the maximum. G.R.

A82-24718 **Boeing Vertol fatigue life methodology.** G. H. Thompson (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 8 p. 7 refs.

It is pointed out that, with respect to basic philosophy, the fatigue life methodology of the considered American helicopter manufacturer has changed little over the years. Major changes have been only in the mechanics of calculation. High-speed computers are performing the work which once had to be done manually. The life calculation procedure is started by developing the mission profile. This consists of a fatigue loading schedule and flight profile splits. To determine the endurance limit of a helicopter dynamic component, full-scale bench fatigue tests are conducted. The use of the fatigue life methodology is illustrated with the aid of an example involving the solution of a hypothetical fatigue life problem. Attention is given to life calculation without cycle counting, life calculation with cycle counting, and the ground-air-ground condition. G.R.

A82-24719 **Helicopter rotor load prediction.** J. G. Yen (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 10 p. 12 refs.

In the preliminary design of rotor components, the fatigue design loads must be estimated. The methods which have been used for estimating the design loads at Bell Helicopter Textron (BHT) are discussed in this paper. A review of rotor loads prediction methods starting with the empirical method used in the earlier years of helicopter design through the application of the sophisticated computer analysis of today is presented. Examples of correlation of blade and pitch-link loads between flight test and analytical prediction for a two-bladed teetering rotor and a four-bladed hingeless rotor in level flight are shown. Results indicate that the accuracy of analytical prediction depends upon an accurate representation of the rotor structure and the use of state-of-the-art aerodynamics and, to a great extent, the user's knowledge and experience with the analysis. Applications of C81 to predicting loads following blade damage are also discussed briefly. (Author)

A82-24720 **Advanced attack helicopter fatigue testing - Overview.** G. D. Deveaux (Hughes Helicopters, Inc., Test Laboratories, Culver City, CA). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 25-27, 1980, Paper.* 13 p.

A description is presented of tests conducted to study the fatigue life of critical components of the YAH-64 helicopter. In accordance with the Airworthiness Qualification Specification six specimens are required to substantiate a fatigue life of 4500 hours. Constant load amplitude, S-N type testing is used for all component tests with the exception of the gun support structure, where spectrum loading type testing is specified. The components required to be fatigue tested belong to the main rotor group, the tail rotor group, the controls group, the drive system group, and the fuselage. The test loading system is discussed, taking into account the general approach, the actuators, and the air springs. Details regarding the data acquisition system are also provided. G.R.

A82-24803 **Novel metal-ceramics-composite sealing coatings in aircraft engines (Neuartige Metall-Keramik-Verbund-Dichtungsbeläge in Flugtriebwerken).** A. Sickinger and V. Wilms (Motoren- und Turbinen-Union München GmbH, Munich, West Germany). In: Composite materials; Lecture and Discussion Meeting, Constance, West Germany, April 17, 18, 1980, Reports. Oberursel, West Germany, Deutsche Gesellschaft für Metallkunde, 1981, p. 133-140. In German.

Requirements for the enhancement of the performance of aircraft engines and the reduction of fuel consumption make it necessary to operate aircraft engines at higher gas pressures and temperatures. The development of novel metal-ceramics-composite sealing coatings makes it possible to overcome certain problems related to more exacting sealing requirements and greater thermal extension in connection with the new operational conditions. The sealing coating provides a means to compensate for different thermal extensions and manufacturing tolerances existing for rotating and stationary structural components. It is feasible to obtain minimum clearance values and to reduce attrition effects for the rotating component. Other important benefits of the coating are related to its thermal-barrier characteristics. Attention is given to the requirements which the coating has to satisfy, its application by thermal spraying, the coating composition, and some test results. G.R.

A82-24805 **Carbon-fiber composites - A fiber composite material for highly stressed light-construction components (CFK - Ein Faserverbundwerkstoff für hochbelastete Leichtbauteile).** G. Stöffler, W. Scheer, and H. Wurtinger (M.A.N. - Neue Technologie, Munich, West Germany). In: Composite materials; Lecture and Discussion Meeting, Constance, West Germany, April 17, 18, 1980, Reports. Oberursel, West Germany, Deutsche Gesellschaft für Metallkunde, 1981, p. 235-250. 7 refs. In German.

The properties of the basic materials used in fiber-reinforced nonmetallic materials are considered, and the calculation of the strength characteristics of the composite material is discussed, taking into account stresses and fiber orientation in the case of the wing of an aircraft. Attention is given to the elasticity characteristics of a unidirectional layer, a fracture criterion for the unidirectional layer, a computational flow diagram for the calculation of the loading capacity of the composite, the fracture characteristics and the mechanical characteristics of carbon-fiber composites (CFC), and the thermal properties of CFC. A description is presented of examples which illustrate various possibilities for an employment of CFC. G.R.

A82-24814 # **Efficient combinations of numerical techniques applied to aircraft turning performance optimization.** D. Blank and J. Shinar (Technion - Israel Institute of Technology, Haifa, Israel). *Journal of Guidance, Control, and Dynamics,* vol. 5, Mar.-Apr. 1982, p. 124-130. 23 refs.

This paper presents efficient combinations of numerical optimization techniques summarizing their relative merits. Four basic methods handling constraints without penalty functions, are considered: (1) sequential gradient-restoration, (2) quasilinearization, (3) neighboring extremals, and (4) direct shooting. The first two are modifications of algorithms introduced by Miele, avoiding numerical differentiation and eliminating the anchoring effect of the original formulation. The third one is a generalization of an algorithm due to Bryson and Ho. The individual and combined methods are tested by solving the optimization of vertical and three-dimensional turning maneuvers as examples. Results show that an appropriate combination of algorithms reduces the computational effort by more than 50%. (Author)

A82-24825 **Recent developments in materials and processes for aircraft corrosion control.** S. J. Ketcham and J. J. De Luccia (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). *SAMPE Quarterly,* vol. 13, Jan. 1982, p. 32-37. 10 refs.

This paper describes advances in materials and processes for aircraft corrosion control currently in use and those under development in the laboratory for future use. Areas covered are corrosion preventive compounds, organic and inorganic coatings, alloy selection and heat treatments. Available materials highlighted are water displacing compounds, sealant primers, aluminum alloys 7050 and 7010 including a state-of-the-art report on the use of exfoliation and stress corrosion resistant tempers. Materials under development that offer promise of contributing to future advances include water displacing paints, flexible primer, crack arrestment compounds, powder metallurgy, aluminum alloys and substitutes for cadmium plating. (Author)

A82-24892 † **A method for the investigation of gyrostabilization systems (Ob odnom metode issledovaniia sistem giroskopicheskoi stabilizatsii).** L. K. Kuz'mina. In: The direct method in stability theory and its applications. Novosibirsk, Izdatel'stvo Nauka, 1981, p. 195-200. 9 refs. In Russian.

The paper examines gyrostabilization systems whose differential equations of motion include a large parameter. The conditions under which a simplified low-order mathematical model can be used to study such systems are investigated. Results are presented for the example of a single-axis gyrostabilizer. B.J.

A82-24970 **Angle of downwash behind a wing in unsteady flow (Srazovy uhel za neustalene obtekanym kridlem).** M. Zadnik. *Zpravodaj VZLU,* no. 4, 1981, p. 167-171. 5 refs. In Czech.

The paper presents a method for determining the angle of downwash behind a wing in the plane of symmetry of the aircraft when the circulation about the wing varies periodically with time. The solution is obtained for an inviscid medium on the assumption of the total rollup of the free and starting vortices. The results are presented in the form of a nomogram. B.J.

A82-24972 **The reliability and safety of small passenger aircraft (Problematika spolehlivosti a bezpecnosti maleho dopravniho letounu).** O. Gregr and V. Kahanek. *Zpravodaj VZLU,* no. 4, 1981, p. 189-195. 5 refs. In Czech.

Problems associated with the reliability and safety assurance of small passenger aircraft during certification are discussed. The philosophy of flight safety assessment according to NLGS-2 requirements is described, and the quantitative limits of the probability of an accident due to damage are determined. Methods of aircraft reliability analysis and testing are briefly described. B.J.

A82-24973 **Spoilers or auxiliary flaps (Spoilery nebo pomocna kridelka).** V. Pokorny. *Zpravodaj VZLU,* no. 5, 1981, p. 213-217. In Czech.

The possibilities and advantages of using auxiliary flaps (that part of ailerons or extended flaps controlled by a servo actuator) instead of spoilers for the improvement of lateral control are discussed. It is shown that the auxiliary flaps have definite advantages over spoilers and allow a wider range of application. B.J.

A82-24974 **Oscillations and vibrations of aircraft on runways (Kmitani a vibrace letadel pri pozemnich operacich).** O. Kropac, J. Sprinc, and M. Prochazka. *Zpravodaj VZLU,* no. 5, 1981, p. 219-234. 8 refs. In Czech.

Analytic and experimental studies on the vibration of aircraft on runways are summarized. The aircraft and the runway are considered as interacting components of a dynamic system. This is taken into account in developing a classification of runways according to surface irregularities and the corresponding dynamic response of the aircraft. Attention is given to the motion of the aircraft as a whole, to vibrations of its parts, and to certain special phenomena, particularly the inverse effect of damping. B.J.

A82-25002 **Analysis of the crossed dipole antenna as a model for aircraft in an electromagnetic environment.** R. W. Burton (Colorado, University, Colorado Springs, CO) and R. W. P. King (Harvard University, Cambridge, MA). In: International Symposium on Electromagnetic Waves, Munich, West Germany, August 26-29, 1980, Proceedings. Munich, International U.R.S.I.-Symposium, 1981, p. 311 A/1-311 A/4. 14 refs.

The currents and charges induced on the metallic skin of a crossed dipole antenna immersed in an electromagnetic plane wave field are analyzed experimentally and theoretically for both electrically thin and electrically thick arm diameters over a wide range of arm lengths highlighting critical boundary conditions. An analysis is also carried out of electrically thick cylinders with flat plate cross arms. The boundary conditions at the junction of the crossed dipole with electrically thin arms are developed and correlated with experimental results over a range of arm lengths that clearly define the boundary conditions on charge and current in the junction area. The results are interpreted in terms of the forced and resonant currents directly evolved from an understanding of the electrically thin receiving unit. C.R.

A82-25011 **Calculation and measurement of electric field strength for airborne antennas in the LF/MF range.** R. J. Luebbers and J. Bash (Ohio University, Athens, OH). In: International Symposium on Electromagnetic Waves, Munich, West Germany, August 26-29, 1980, Proceedings. Munich, International U.R.S.I.-Symposium, 1981, p. 334 A/1-334 A/4. 5 refs.

A technique has been developed to calibrate in absolute field strength the loop antenna and associated receiving system for the Automatic Direction Finding equipment for three different aircraft. The calibrated receiving systems are flown at a variety of altitudes over various types of terrains, and field strengths for signals in the desired frequency range are measured. A comparison is made between calculated and measured results, showing good agreement to within a few dB, and confirming the accuracy of both the calibration method and the propagation model. D.L.G.

A82-25050 # **AFWAL turbine engine controls research and development - Present and future.** L. L. Small (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0321.* 7 p. 9 refs.

It is noted that, within the next few years, digital computer-based engine controls will see operational use in both military and commercial applications. Current and planned activities at the Air Force Wright Aeronautical Laboratories in the areas of multivariable control logic, control system integration, and reliability/flight safety are reviewed. C.R.

A82-25113 # **Rapid extraction of layer relative humidity, geopotential thickness, and atmospheric stability from satellite sounding radiometer data.** W. L. Smith (NOAA, National Earth

Satellite Service, Madison, WI) and F. X. Zhou. *Applied Optics,* vol. 21, Mar. 1, 1982, p. 924-928. 5 refs.

Algorithms are presented which allow fast retrieval of major meteorological parameters from individual radiance measurements, thereby avoiding the time consuming radiative transfer equation inversion process as required for detailed vertical profile determinations. The relative humidity and geopotential thickness patterns from satellite data are shown to be consistent with radiosonde data. The atmospheric stability index, total-totals, calculated from satellite derived relative humidities and geopotential thicknesses is in good agreement with subsequent convective weather. Computer programs based on the proposed algorithms produce contour displays of the humidity, geopotential thickness, and total-totals within 10 min of the ingestion of the satellite data. V.L.

A82-25119 **Aircraft/airport compatibility - A constant challenge for aircraft designers.** W. E. Parsons and M. E. Wilfert (Douglas Aircraft Co., Long Beach, CA). *Exxon Air World,* vol. 34, no. 1, 1982, p. 18-21, 30.

The consideration given during airport planning and aircraft design to the compatibility of the two systems is described, with attention to the impact of design alternatives on direct, indirect and total operating costs through the reduction of ground time for storage and maintenance. Major aspects of existing and planned airport facilities considered during aircraft design include runway length and width, taxiway width, pavement fillets, and pavement strength, along with the location and accessibility of the various servicing points of the aircraft. Emphasis is placed on the avoidance of sequencing in servicing operations, so that lavatory, water, electrical, pneumatic and air conditioning systems may be readied for flight simultaneously. O.C.

A82-25154 * # **The design of a wind tunnel VSTOL fighter model incorporating turbine powered engine simulators.** R. O. Bailey (NASA, Ames Research Center, Moffett Field, CA), M. R. Maraz, and P. E. Hiley (Douglas Aircraft Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, AIAA Paper 81-2635.* 27 p. 8 refs. Contract No. F33615-77-C-2097.

A wind-tunnel model of a supersonic VSTOL fighter aircraft configuration has been developed for use in the evaluation of airframe-propulsion system aerodynamic interactions. The model may be employed with conventional test techniques, where configuration aerodynamics are measured in a flow-through mode and incremental nozzle-airframe interactions are measured in a jet-effects mode, and with the Compact Multimission Aircraft Propulsion Simulator which is capable of the simultaneous simulation of inlet and exhaust nozzle flow fields so as to allow the evaluation of the extent of inlet and nozzle flow field coupling. The basic configuration of the twin-engine model has a geometrically close-coupled canard and wing, and a moderately short nacelle with nonaxisymmetric vectorable exhaust nozzles near the wing trailing edge, and may be converted to a canardless configuration with an extremely short nacelle. Testing is planned to begin in the summer of 1982. A.L.W.

A82-25213 **Conflicts between random flights in a given area.** S. Ratcliffe and R. L. Ford (Royal Signals and Radar Establishment, Malvern, Worcs., England). *Journal of Navigation,* vol. 35, Jan. 1982, p. 47-71; Discussion, p. 72-74. 18 refs.

The present investigation is concerned with the segregation of air traffic in space and a division of the available sky in various sections to minimize conflicts between the various users. Random air traffic in a bounded volume of airspace outside the controlled airspace is considered. It is assumed that aircraft are all in straight line flight. The constraints make it possible to construct a model whose behavior can be defined quantitatively as an algebraic function of the small number of input parameters. Attention is given to a computer model, two-dimensional traffic, the constraints on the use of airspace, conflicts in three-dimensional airspace, the collision rate as a function of traffic mix, and alarm criteria for an advisory service. G.R.

A82-25216 * # **Advanced electronic displays and their potential in future transport aircraft.** J. J. Hatfield (NASA, Langley Research Center, Hampton, VA). *International Air Transport Association, Technical Symposium on Aviation Technology in the 80's, Montreal, Canada, Dec. 1-4, 1981, Paper.* 26 p. 29 refs.

It is pointed out that electronic displays represent one of the keys to continued integration and improvement of the effectiveness of avionic systems in future transport aircraft. An employment of modern electronic display media and generation has become vital in connection with the increases in modes and functions of modern aircraft. Requirements for electronic systems of future transports are examined, and a description is provided of the tools which are available for cockpit integration, taking into account trends in information processing and presentation, trends in integrated display devices, and trends concerning input/output devices. Developments related to display media, display generation, and I/O devices are considered, giving attention to a comparison of CRT and flat-panel display technology, advanced HUD technology and multifunction controls. Integrated display formats are discussed along with integrated systems and cockpit configurations. G.R.

A82-25323 # **Secondary radar problems - The presence of false echoes (Problemas del radar secundario - Presencia de ecos falsos).** M. G. Duran (Paracuellos del Jarama, Centro de Control de Navegación Aérea, Paracuellos del Jarama, Spain). *IAA/Ingeniería Aeronáutica y Astronáutica,* vol. 34, Jan. 1982, p. 5-10. In Spanish.

Techniques are described for the suppression of false radar echoes due to: (1) lateral lobe radar responses; (2) radar responses out of synchrony with the signals of the radar system; (3) responses corresponding to signals from previous radar repetition periods; (4) responses produced by a split in the number of echoes from a target aircraft; and (5) responses due to reflections. The most frequently used technique for the correction of these false-echo effects is improved side lobe suppression (ISLS), which involves the emission of radar pulse signals from an omnidirectional antenna. Techniques complementing ISLS include the false return elimination device and transponder suppression transmitter. False echo suppression by data processor programming techniques is also described. O.C.

A82-25324 # **Electronic flight instrument systems /EFIS/, the instrumentation of the 1980s (La instrumentación de los 80 /E.F.I.S./).** J. B. Galente. *IAA/Ingeniería Aeronáutica y Astronáutica,* vol. 34, Jan. 1982, p. 18-23. In Spanish.

The development of high-luminosity, high-resolution color coded CRT systems for the display of symbolic and alphanumeric flight data in cabins of 767/757-type commercial aircraft is discussed. These electronic flight instrument systems (EFIS) depend for their effectiveness on the incorporation of two techniques: (1) the shadow mask tube, derived from the trinitron color CRTs in use in radar color display terminals; and (2) stroke writing, in which each CRT electron gun can prolong its excitation of a given screen area under the control of a microprocessor. Progress in the development and experimental validation of these instruments has been so rapid as to allow general aviation use to begin in 1982. The more extensive use of CRTs in an 'all glass cockpit', pending further development, is also considered. O.C.

A82-25325 # **The toll of ILS-preventable aviation accidents (Costo de los accidentes aéreos evitables con ILS).** E. L. Abella. *IAA/Ingeniería Aeronáutica y Astronáutica,* vol. 34, Jan. 1982, p. 31-34. In Spanish.

Based on the statistical analysis of Simpson (1975), observations are presented concerning the aviation accidents which occurred in the U.S. from January 1964 to December 1972, with emphasis on landings. An attempt is made to determine the portion of those landing approach accidents that could have been prevented through the use of IFR procedures of a high degree of precision. Results are presented for the cases of commercial aviation, commuter aviation, and general aviation, and comparisons are made with general aviation VFR accidents. All comparative data are presented in tabular form. Attention is given to the estimation of preventable property losses as well as loss of lives. J.C.

A82-25347 † **Problems of numerical simulation of unsteady three-dimensional viscous-gas flows in nozzles (O zadachakh chislennogo modelirovaniia nestatsionarnykh prostranstvennykh techenii viazkogo gaza v soplakh).** A. T. Fedorchenko. *Zhurnal Vychislitel'noi*

Matematiki i Matematicheskoi Fiziki, vol. 22, Jan.-Feb. 1982, p. 178-196. 26 refs. In Russian.

The paper examines certain general problems involving the use of the complete Navier-Stokes equations for the numerical simulation of unsteady three-dimensional viscous-gas flows in nozzles. Models of porous boundaries are examined, and their acoustic characteristics are investigated. Attention is given to aspects of the control of gasdynamic (especially acoustic) parameters in such flows. As an example, a numerical analysis is presented of axisymmetric unsteady flows of a viscous gas in a region containing a Laval nozzle. B.J.

A82-25353 † **Stability of a three-stage dynamic stand (Ob ustoichivosti trekhstepennogo dinamicheskogo stenda).** N. V. Osadchenko. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Tverdogo Tela,* Jan.-Feb. 1982, p. 20-27. 10 refs. In Russian.

The small-parameter method is used to derive equations of partial motion components for a three-stage dynamic stand designed for simulating the angular motions of moving objects. The fast-motion stability of the system is analyzed using a previously proposed method whereby the stability problem for three-axis systems is reduced to that for single-axis systems. A matrix interpretation of this method is presented, and stability bounds are determined. V.L.

A82-25499 **Importance of a tactical cargo aircraft in emergency relief (Intérêt d'un avion cargo tactique dans les secours d'urgence).** J. P. Chabanne (Service de Santé pour l'Armée de l'Air, Ecole d'Application; Centre de Recherche de Médecine Aérospatiale, Paris, France) and G. Jacob (Commandement du Transport Aérien Militaire, Vélizy-Villacoublay, Yvelines, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 20, no. 79, 1981, p. 210-214. 7 refs. In French.

The use of the C 160 Transall aircraft in emergency relief operations at the site of medical disasters is discussed. Capabilities of the C 160 allow it to be useful for a number of purposes: (1) the transport of medical personnel and equipment into the disaster region; (2) the medical evacuation of the seriously ill and injured; (3) the resupply of the stricken area with food, fuel and medical supplies; (4) the supplementation of communications damaged by the disaster. Despite limitations in range, velocity and capacity, experience in humanitarian relief operations in Peru, Jordan and Nicaragua has shown its capacity to land on uneven terrain and robustness to make the C 160 a valuable tool in disaster intervention. A.L.W.

A82-25510 **Selection of telecommunication equipment - A new approach to the equivalent cost concept (Choix d'investissements en matériels de télécommunications - Une nouvelle approche de la notion de coût équivalent).** M. Minoux (CNET, Paris; CNET, Issy-les-Moulineaux, Hauts-de-Seine, France) and A. Guerard (CNET, Issy-les-Moulineaux, Hauts-de-Seine, France). *Annales des Télécommunications,* vol. 36, Nov.-Dec. 1981, p. 602-612. 5 refs. In French.

In order to apply cost equivalence to the purchase of telecommunication equipment from components with equal functional features, but with different costs and length of payback, an extension of amortization calculations was performed. It is shown that the increase in demand is not necessarily exponential, that the law of variation of optimal cost equivalence can be read directly from the curve of net costs of the equipment under consideration, that actualized costs depend on the criteria of the actual payback period. Each year of functional addition to the operating system is included in the calculations, rather than the projected lifetime. The payback period then becomes the prime criteria for determining the economics of the equipment added incrementally to the capacity of the network. The economics of a linear growth of demand are determined, and then extended to any form of growth with a constant economy-of-scale coefficient. M.S.K.

A82-25538 **Where is cobalt irreplaceable (Wo ist Kobalt unersetzlich).** J. C. Agarwal (Charles River Associates, Inc., Boston, MA). *(International Conference on Cobalt-Metallurgy and Uses, Brussels, Belgium, Nov. 10-13, 1981, Paper.) Metall,* vol. 36, Mar. 1982, p. 292, 293. In German.

It is pointed out that cobalt, at least on a short-term basis, is nearly irreplaceable in connection with certain of its applications, taking into account, in particular, its use in catalysts and in heat-resistant superalloys. Cobalt-containing superalloys are employed in gas turbines and engines, in connection with efforts related to the search for oil reservoirs and their exploitation, and in medical implants. A number of aircraft engines utilize cobalt as alloy component. The irreplaceableness of cobalt on a short-term basis is partly related to the long time required to develop a new aircraft engine. Cobalt is also widely used in the manufacture of permanent magnets. A crucial asset of cobalt with respect to its employment in equipment used for offshore drilling operations is its resistance against hydrogen sulfide and effects of marine climate conditions. Attention is also given to aspects of cobalt production and market trends. G.R.

NEW DEVELOPMENTS IN COCKPIT-HUMAN INTERFACES
E. B. Davies and J. B. Peckham 15 Jun. 1981 16 p Presented at 12th ICAS Congr., Munich, Oct. 1980
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Touch sensing displays, helmet sights, and direct voice inputs (DVI) are discussed. Cathode ray tubes (CRT) are cheaper than keyboards for touch sensing, but lack tactile differentiation capabilities. For designation tasks, e.g., touching the required radar return, accuracy must be much higher than for keyboarding. Head movement filtering is a problem with helmet sights, since output is delayed if too much filtering is attempted, and accuracy suffers if vibration is ignored. Cuing by LED's is restricted by the number of leads the helmet can incorporate, and CRT's are too heavy. Factors affecting DVI performance include electronic noise on intercoms, microphone to mouth distance, voice changes caused by stress, and the number of commands pilots can remember. Author (ESA)

N82-18216# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
AN ON BOARD SUPERVISORY SYSTEM FOR APPLICATIONS IN SPACE MISSIONS [UM SISTEMA DE SUPERVISAO DE BORDO PARA APLICACOES EM MISSOES ESPACIAIS]
Jose Carlos Maldonado and Ricardo deAzevedo Mendes Jun. 1981 13 p refs In PORTUGUESE; ENGLISH abstract Presented at the 2nd Natl. Automation Meeting, Salvador, Bahia, Brazil, Jul. 1981
(INPE-2097-RPE/327) Avail: NTIS HC A02/MF A01

The system, developed in the digital and analog system group/program, enables full duplex communication between an onboard and a ground microcomputer, based on a reserved protocol. The system performs the following functions: data acquisition, control, transmission and reception between an onboard payload and a ground station. It also executes housekeeping tasks and telecommand operations. This systems was, in particular, utilized in the balloon mission PEROBA-I. The performance of the system in the mission was satisfactory. T.M.

N82-18217# Hughes Aircraft Co., Canoga Park, Calif.
ANALYSIS OF BUILT-IN-TEST (BIT) FALSE ALARM CONDITIONS Final Technical Report, 24 Jan. 1980 - 28 Feb. 1981
John G. Malcolm and Richard W. Highland Griffiss AFB, N.Y. RADC Aug. 1981 122 p refs
(Contract F30602-80-C-0074; AF Proj. 2338)
(AD-A108752; RADC-TR-81-220) Avail: NTIS HC A06/MF A01 CSCL 14/2

Usefulness of BIT is seriously affected by the presence of false alarms. False alarms can degrade mission effectiveness of systems and contribute to the expenditure of excessive maintenance resources. The objectives of this study were to determine the root causes of the false alarm problem and to develop design guidelines to minimize the occurrence and the effect of false alarms. False alarm rates have been established for the three systems investigated and prediction factors defined. Author (GRA)

N82-18218# Lockheed-Georgia Co., Marietta.
ANALYTICAL STUDY OF COCKPIT INFORMATION REQUIREMENTS Final Report, Oct. 1979 - Nov. 1980
J. D. Caldwell and T. G. Jones Washington FAA Apr. 1981 165 p refs
(Contract DOT-FA79WA 4368)
(AD-A108524; LG80ER0200; FAA/RD-81/4) Avail: NTIS HC A08/MF A01 CSCL 01/3

An assessment is made of cockpit information requirements likely to be imposed on aircraft in the next fifteen years as a result of improvements in the ATC system and in aircraft design. These requirements are analyzed by work centers and include flight control, navigation, collision avoidance, flight management, communications, caution/warning and monitoring, and checklist functions. From a baseline of current requirements and technology, the application of new requirements and technology is analyzed. Three aircraft are hypothesized representing three time periods of technical development. The purpose is to investigate the impact of future ATC changes on differently equipped aircraft. GRA

N82-18219# Arinc Research Corp., Annapolis, Md.
IMPACT OF TECHNOLOGY ON AVIONICS COST TRENDS
Steven Toth, William Lovelace, and Kelly Markin Nov. 1981 84 p
(Contract DTFA-01-80-C-10030)
(AD-A108494; Rept-1378-40-2-2553; FAA-EM-82-6) Avail: NTIS HC A05/MF A01 CSCL 09/3

This study provides an overview of nonmilitary generally aviation and commercial avionics price and cost structures as influenced by technology. It quantifies, computes, and evaluates the unique characteristics and behavior patterns of the industry, especially those that affect the frequency of innovation, the rate of technology diffusion from manufacturer to manufacturer or from product to product, and the anticipated major cost drivers of the future. The report reviews the impact of technology on the cost of avionics during the past 20 years and projects this impact for the next 20 years. This report concentrates on avionics in the low-performance general aviation aircraft category because they are the major components of the avionics industry. Typical units of detailed study are transponders, transceivers, navigation receivers, and course deviation indicators (CDIs). An examination of the price histories of more than twenty equipment families indicates that unit prices have been and are likely to continue increasing at the Producer Price Index (PPI) rate. This rate of price growth results from a balance between costs rising at the Consumer Price Index (CPI) rate and manufacturing cost reductions made possible through the introduction of new technologies. Author (GRA)

N82-18220# National Aerospace Lab., Amsterdam (Netherlands). Scientific Services Div.
TRENDS IN AIRLINE AVIONICS
F. J. Abbink 13 Mar. 1980 30 p refs Presented at Netherlands Assoc. of Aeron. Engr. Symp. on Develop. in Avionics, Delft, 25 Apr. 1980
(NLR-MP-80013-U) Avail: NTIS HC A03/MF A01

The evolution of aeronautical electronics is described. Trends towards system integration for airliners are indicated. The development of airline avionics specifications by the airlines and constructors is outlined. The design and function of avionics equipment, e.g., navigation aids, are explained. The Aeronautical Radio Incorporated 700 automatic flight system is introduced as an example of a system suited to the next generation of airliners. Radio navigation, communication and identification equipment are controlled by the digital frequency/function selection unit. Automatic flight control and auto-throttle functions are executed by flight control and thrust control computers. Author (ESA)

N82-18221# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.
INTEGRATION OF COMPLEX SYSTEMS IN CURRENT AND FUTURE AIRCRAFT PROJECTS FOR THE EXAMPLE OF AVIONICS [INTEGRATION KOMPLEXER SYSTEME IN LAUFENDE UND ZUKUENFTIGE FLUGZEUGPROGRAMME AM BEISPIEL DER AVIONIK]
H. Haeuser 31 Jan. 1980 38 p In GERMAN
(MBB-UH-18-80-O) Avail: NTIS HC A03/MF A01

Equipment for electrical and avionic systems, and special equipment needed in the airplane program were developed. Avionics is defined as: airplane structure, airplane equipment (besides the mechanical system) includes that part of the equipment system which is supported by the electric and electronic system, and construction and general instruments necessary in airplane construction. Avionics enables the supply, transfer, processing, and production (activation) of information for the management of airplane systems, control of airplanes, and the execution of special functions. Transl. by E.A.K.

N82-18222*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECTS OF FAN INLET TEMPERATURE DISTURBANCES ON THE STABILITY OF A TURBOFAN ENGINE
Mahmood Abdelwahab Dec. 1981 36 p refs
(NASA-TM-82699; E-982) Avail: NTIS HC A03/MF A01 CSCL 21E

The effects of steady-state and time-dependent fan inlet total temperature disturbances on the stability of a TF30-P-3 turbofan engine were determined. Disturbances were induced by a gaseous-hydrogen-fueled burner system installed upstream of the fan inlet. Data were obtained at a fan inlet Reynolds number index of 0.50 and at a low-pressure-rotor corrected speed of 90 percent of military speed. All tests were conducted with a 90 deg extent of the fan inlet circumference exposed to above-average temperatures. T.M.

N82-18223# Vereinigte Flugtechnische Werke-Fokker G.m.b.H., Bremen (West Germany).

FURTHER DEVELOPMENT OF THE TEST CONCEPT OF THE ALPHA JET ENGINE LARZAC 04 [WEITERENTWICKLUNG DES PRUEFKONZEPTES FUER DAS ALPHA-JET-TRIEBWERK LARZAC 04]

Ernst Lerche 1981 33 p In GERMAN Presented at Seminar Prueftech. und Pruefstandstech., Hannover, 3 Apr. 1981
Avail: NTIS HC A03/MF A01

The test stand for the LARZAC 04 jet unit for the Alpha jet aircraft was developed. The test stand is outlined, and equipment extension, and a maintenance procedure for the driving system are presentud. Transl. by E.A.K.

N82-18224# Honeywell Systems and Research Center, Minneapolis, Minn. Aerospace and Defense Group.

INTEGRATED CONTROL DESIGN TECHNIQUES Final Report, Jun. 1979 - Nov. 1980

A. L. Jones, J. K. Mahesh, M. A. Kollodge, D. P. Pledger, E. R. Rang, and K. D. Graham Wright-Patterson AFB, Ohio AFWAL Aug. 1981 314 p refs
(Contract F33615-79-C-3609; AF Proj. 2403)
(AD-A108223; Rept-80SRC82; AFWAL-TR-81-3074) Avail: NTIS HC A14/MF A01 CSCL 01/3

A total systems approach methodology and computer-aided design tool for integrated flight control design and evaluation has been formulated. This methodology is a composition of classical system design steps and system performance, reliability/survivability, packaging and cost evaluation techniques assembled for interactive computer-based execution. The interactive sensor integration program developed under this methodology addresses the sensor requirements of the flight control, guidance and navigation, and weapon delivery functions as directed interactively by the designer and the mission, the system configuration, cost, power, weight, volume constraints and total system performance. The demonstration program contains performance reliability, size, power, weight, cost data for gyros, accelerometers, radars, seekers and air data systems in addition to analysis tools for evaluating navigation system accuracy, probability of target acquisition, and probability of kill for selected targets and weapons. Author (GRA)

N82-18225# Instituut TNO voor Bouwmaycrialen en Bouwconstructies, Delft (Netherlands).

INVESTIGATION INTO THE UTILITY OF SOME QUICK SETTING CEMENTS FOR RUNWAY REPAIR [ONDERZOEK NAAR DE BRUIKBAARHEID VAN ENKELE SNELVERHARDENDE BINDMIDDELEN VOOR REPARATIE VAN STARTBANEN]

Mar. 1980 39 p refs In DUTCH
(B-80-157/60.7.0157; TDCK-75056) Avail: NTIS HC A03/MF A01

The application of quick setting cements in rapid runway repair was investigated. Needed strength and layer thickness of the hardening material was determined. The following results are reported: (1) it is possible to fill up a hollow space with quick setting cements, even in combination with proper additives like super plastifiers; (2) pressure strength for hardening time is accomplished within one hour; (3) a fast operating method is needed to prevent debinding of cement, continuous mixers for smaller quantities are recommended. Transl. by E.A.K.

N82-18226# Institute for Perception RVO-TNO, Soesterberg (Netherlands).

THE LINK-HILES DRIVER TRAINING SIMULATOR FOR TRACKED VEHICLES: THE EFFECT OF METHOD AND DURATION OF TRAINING ON THE TRANSFER OF TRAINING

K. J. Poll 1980 20 p refs In DUTCH; ENGLISH summary
(Contract A76/KL/148)
(IZF-1980-28; TDCK-75019) Avail: NTIS HC A02/MF A01

Transfer of training through different methods and durations of training from a driving simulator to a task was investigated. In method A the candidates were under strict guidance of the instructor, while in method B the candidates trained more on their own and paid more attention to the integration of the part-tasks. The duration of training was dependant on the performance-level on which the candidate turned over from the simulator to the real tanks. These performance-levels were: the single trial execution of all tasks (low level), having all tasks under control (medium level), and sufficient integration of all part-tasks (high level). From the results it is clear that when the candidates were trained in pairs the mean number of kilometers for the two candidates shows to difference as a function of training method. Although the 'first' candidate needs less kilometers with method B, and 'second' candidate learns more from the 'first' with method A. The number of kilometers on the tank, necessary to pass the final driver's test, is a linear relation as a function of the duration of simulator training. J.M.S.

N82-18227# Coppin State Coll., Baltimore, Md.

TASK ANALYTIC TECHNIQUES: APPLICATION TO THE DESIGN OF A FLIGHT SIMULATOR INSTRUCTOR/OPERATOR CONSOLE Final Report

Charles D. Sanders Brooks AFB, Tex. Air Force Human Resources Lab. Dec. 1981 21 p refs Prepared for Southeastern Center for Electrical Engineering Education, St. Cloud, Fla. Submitted for publication
(Contract F49620-79-C-0038; AF Proj. 9983)
(AD-A108724; AFHRL-TP-81-38) Avail: NTIS HC A02/MF A01 CSCL 14/2

Instructional Systems Development (ISD) has contributed to the efficiency and low cost of air flight training through the medium of the simulator. Task analysis is a component of ISD, and its application to the improvement of devices such as simulator instructor/operator consoles will continue to enhance the quality of flight training. Task analytic techniques are inextricably interwoven into the design of an instructor/operator console. The application involves the process, persons, and a machine within the context of a flight simulator. The tasks of the instructor and student are primary in the design process. The efficiency and economy of the task analytic process has implications for its use in the future developments of automated flight training. Author (GRA)

N82-18228# SRI International Corp., Arlington, Va.

EVALUATION OF THE NORTH ISLAND A/C CRASH/RESCUE TRAINING FACILITY

R. S. Alger Aug. 1981 153 p refs
(Contract N00014-80-C-0696; SRI Proj. PYU-1943)
(AD-A108740) Avail: NTIS HC A08/MF A01 CSCL 05/9

Under Executive Order 11752, the Navy and the Air Force began a cooperative effort to develop training facilities that could provide more fire fighting training with less smoke and water pollution. Soon the central issue of pollution control was surrounded by a series of satellite questions that had to be answered before training facilities could be designed, e.g., what type of training is required; how much training should be provided; where should fireman train; and how much departure from the real emergency situation is permissible. Various public and private groups contributed answers. The Naval Air Station, North Island, San Diego, Calif., Aircraft/Crash Fire Rescue Training Facility is the first Navy facility constructed as an outgrowth of this effort to improve training while reducing the environmental impact to an acceptable level. This report evaluates the performance of the North Island facility in a series of environmental and training tests. The scope includes: (1) the evaluation procedure and results; (2) a comparison to other training options; and (3) recommendations for future training activity. GRA

N82-18229# Army Engineer Waterways Experiment Station, Vicksburg, Miss. Geotechnical Lab.

BOMB CRATER REPAIR TECHNIQUES FOR PERMANENT AIRFIELDS. REPORT 1: SERIES 1 TESTS Technical Report, Jul. - Nov. 1978

David L. Cooksey Oct. 1981 129 p refs
(AD-A108716; WES/MP/GL-81-12) Avail: NTIS HC A07/MF A01 CSCL 13/2

A test section with six simulated bomb craters was constructed for the purpose of developing an improved field method of repair and restoration of air base runways damaged by enemy attack. The crater repair materials tested in the reconstruction were a high-quality crushed stone, grouted concrete, portland cement concrete (PCC), and asphaltic concrete (AC). The performances of the different materials were evaluated under full-scale load testings with the F-4 and C-141 aircraft loadings. The gravity grout solution and the high-quality crushed stone method performed beyond required coverage levels and seem to be the two high candidate material systems for further research. The solutions were accomplished with the time.

STAR ENTRIES

N82-18119# Deutsche Gesellschaft fuer Luft- und Raumfahrt, Cologne (West Germany).
SEVENTH EUROPEAN ROTORCRAFT AND POWERED LIFT AIRCRAFT FORUM
1981 951 p refs Proceeding of Conf. Held in Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981 Original contains color illustrations
Avail: NTIS HC A99/MF A01

Aspects of helicopter and turbine rotor are addressed.

N82-18120# Southampton Univ. (England). Dept. of Aeronautics and Astronautics.
DEVELOPMENTS IN ROTARY WING AIRCRAFT AERODYNAMICS
I. C. Cheeseman *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 27 p refs

Avail: NTIS HC A99/MF A01

Developments in helicopter aerodynamics are reviewed, including new blade sections and planforms. Computer modelling of the flow and the need for further work in predicting oscillating loadings are considered. The greater attention being given to the need to reduce drag in forward flight due to extended range and fuel conservation costs is recognized. A forecast of advances is made. N.W.

N82-18121# Massachusetts Inst. of Tech., Cambridge.
A SIMPLIFIED APPROACH TO THE FREE WAKE ANALYSIS OF A HOVERING ROTOR
R. H. Miller *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 15 p refs

Avail: NTIS HC A99/MF A01

Rotor wake geometry and the number of blades are analyzed. Simplified approaches to the free wake aerodynamic analysis of hovering rotors permitting rapid evaluation of rotor aerodynamic characteristics are discussed. Analytical results are compared with existing measurements of blade bound circulation and wake geometry. N.W.

N82-18122# Politecnico di Milano (Italy). Instituto di Ingegneria Aerospaziale.
AN EXPERIMENTAL ANALYSIS OF THE SHAPE OF A ROTOR WAKE
Sergio DePonte and Luigi Vigevano *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 8 p refs

Avail: NTIS HC A99/MF A01

Although the shape of a rotor wake may be described by potential flow methods, to get reasonable calculation costs it is necessary to introduce some simplification in the calculations. In order to check the accuracy and the validity field of the various assumptions a set of experimental data may be a good tool for comparisons. A hot wire technique to detect the presence of the blade wake is presented. N.W.

N82-18123# Tokyo Univ. (Japan).
AN EXTENSION OF THE LOCAL MOMENTUM THEORY TO THE ROTORS OPERATING IN TWISTED FLOW FIELD

Akira Azuma, Ken-ichi Nasu, and Takatoshi Hayashi *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs
Avail: NTIS HC A99/MF A01

The local momentum theory was developed to calculate the dynamic airloading of a helicopter rotor, where the velocity perpendicular to the plane of rotation was assumed to be negligibly low in comparison with the rotating velocity. In the case of propellers or windmills, however, this assumption is no longer adequate, and the flow field seen in the rotor-fixed-coordinate system is noticeably twisted along the span. In order to permit calculation of the induced velocity distribution as well as the airloading of the blade in such a twisted flow field, we have carried out an extension of the local momentum theory. Since our method of calculation is based on the instantaneous circulation distribution rather than the instantaneous momentum balance, it may be called the Local Circulation Method. The present method is also applicable to propellers and windmills in yawed flow. Author

N82-18124# Nanjing Aeronautical Inst. (China).
A SIMPLIFIED METHOD FOR PREDICTING ROTOR BLADE AIRLOADS
Wang Shi-cun and Xu Zhi *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 28 p refs

Avail: NTIS HC A99/MF A01

Relations of first two harmonic induced velocities to the lower and same-order harmonic circulations are obtained from the generalized classical vortex theory of the rotor. Then, based on the blade element theory, a closed form of equations for circulation is established and, by taking the flapping condition into account, simplified formulae for predicting rotor blade airloads are set up. In particular, expressions of flapping coefficients are derived, including the effect of variable induced velocity distribution but in terms of blade parameters and flight parameters only. Finally, a calculation of a typical example is made and comparisons of airloads with those from the more accurate numerical solution are shown that the present method is fairly suitable for aerodynamic analysis and preliminary design of helicopters. Author

N82-18125# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
A THREE-DIMENSIONAL APPROACH TO LIFT AND MOMENT COEFFICIENTS OF ROTATING BLADES
Wolfgang Send *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p refs (For primary

Avail: NTIS HC A99/MF A01

The three dimensional incompressible flow around a thick blade is calculated in the limiting case of an infinitely high Reynolds number. The solution for a four bladed rotor is achieved by interacting the mutual influence of the induced velocities on the blades. Several properties of the three dimensional approach are compared with two dimensional theories. Unsteady results are obtained by combining the quasi-steady flow with the calculation for a given oscillation mode. The integral equation for the flow around the blades is solved by a higher order panel technique for the vorticity vector, continuous on the blade and downstream in the wake. An improper description of the wake integral is evident. The helical wake is substituted by its rectilinear counterpart, for which an analytical description was found. N.W.

N82-18126# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
A COMPLETE METHOD FOR COMPUTATION OF BLADE MODE CHARACTERISTICS AND RESPONSES IN FORWARD FLIGHT
J. P. Lafrancq and B. Mesure *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 9 p

Avail: NTIS HC A99/MF A01

Hypotheses and equations, methods of calculation, and numerical adaptation concerning the dynamics of helicopter rotors are dealt with. Two problems raised by a spinning rotor are also dealt with: determination of natural models qualified by their eigen frequency and damping; and forward flight, using the azimuth method which avoids those difficulties inherent to the modal methods. The calculation process used to improve a rotor while at design stage is illustrated. N.W.

N82-18127# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
**MODAL CHARACTERISTICS OF ROTOR BLADES: FINITE

manpower, equipment, and performance constraints of operational requirements. GRA

N82-18230# Army Engineer Waterways Experiment Station, Vicksburg, Miss. Geotechnical Lab.
INVESTIGATION OF COMPACTION CRITERIA FOR AIRPORT PAVEMENT SUBGRADE SOILS Final Report, Mar. 1978 - Apr. 1981
William N. Brabston Washington, D.C. FAA Oct. 1981 174 p refs
(Contract DOT-FA78WAI-876)
(AD-A108518; WES/TR/GL-81-11; FAA-RD-81-48) Avail: NTIS HC A08/MF A01 CSCL 08/13

A study was conducted to determine the effect of lowering soil density requirements for subgrades under airport pavements. The investigation was primarily a laboratory effort in which molded specimens of three different soil types, compacted to densities at and below those currently specified by FAA criteria, were subjected to repeated axial loadings in a triaxial compression chamber. The primary response parameters of interest were permanent and resilient axial strain. Test results were formulated into a statistical model to predict permanent soil strain based on soil characteristics such as density, clay content, compaction characteristics, and sheer strength. The strain model was used to calculate values of permanent soil deformation at the surface of the subgrade for various combinations of soil density. Results of the test indicated that the wide variation in soil response among the three materials tested precluded any general alteration in current FAA compaction criteria. Author (GRA)

N82-18231# Textron Bell Helicopter, Fort Worth, Tex.
ROTORCRAFT FLIGHT SIMULATION COMPUTER PROGRAM C81 WITH DATAMAP INTERFACE. VOLUME 2: PROGRAMMER'S MANUAL Final Report
P. Y. Hsieh Oct. 1981 264 p Supersedes USAAMRDL-TR-76-41A, USAAMRDL-TR-76-41B, and USAAMRDL-TR-76-41C
(Contract DAAK51-79-C-0015; DA Proj. 1L1-62209-AH-76)
(AD-A108294; BHT-699-099-111-Vol-2; USAAVRADCOM-TR-80-D-38B; USAAMRDL-TR-76-41A; USAAMRDL-TR-76-41B; USAAMRDL-TR-76-41C) Avail: NTIS HC A12/MF A01 CSCL 09/2

This report documents the current version in the C81 family of rotorcraft flight simulation programs developed by Bell Helicopter Textron. This current version of the digital computer program is referred to as AGAP80. The accompanying program for calculating fully coupled rotor blade mode shapes is called DNAM05, and an associated rotor wake program is called AR9102. The AGAP80 version of C81 was developed by adding some analytical features to the AGAJ76 version and including the ability to generate Data Transfer Files for use by the File Creation Program of DATAMAP. An overview of the computer program capabilities and the principal mathematical models incorporated in the program are given in Volume I of the documentation for the AGAJ76 version of the program. Volume I, the User's Manual, contains detailed information necessary for setting up an input data deck and interpreting the computed data. Volume II, includes a catalog of subroutines and a discussion of programming considerations. GRA

N82-18232# Naval Air Engineering Center, Lakehurst, N.J. Ship Installation Engineering Dept.
INVESTIGATION OF CROSSDECK PENDANT CATAPULT SLOT INTERACTION; PROPOSED CORRECTIVE MEASURES Final Report, Apr. 1978 - Mar. 1979
Alvin Hittner 20 Nov. 1981 56 p ref
(AD-A108149; NAEC-91-7964) Avail: NTIS HC A04/MF A01 CSCL 01/5

This report documents the investigation of the crossdeck pendant failure aboard USS JOHN F. KENNEDY (CV 67) in March 1978, which caused the loss of an F-14A. Included are the results of a survey to determine the scope of the deck pendant/catapult slot interaction problem, testing to confirm the failure sequence, and the evaluation of slot filler devices (buttons) to resolve the problem. Author (GRA)

N82-18233# MGA Research Corp., Buffalo, N.Y.
TEST SITE INSTRUMENTATION STUDY. VOLUME 2: CRASH 1 AND CRASH 2 RAW DATA Final Report, 22 Mar. 1980 - 31 Mar. 1981
Rudy H. Arendt and Patrick M. Miller Jun. 1981 150 p refs
(Contract DOT-HS-8-01936)
(PB82-111832; G22-V-2; DOT-HS-805980-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 13F

The data acquisition and reduction practices at fifteen crash and sled testing facilities which normally produce impact test data for the NHTSA were reviewed. Attention was focused on dynamic response characteristics, instrumentation calibration procedures, filtering techniques, equipment properties and analog to digital conversion techniques. GRA

N82-18327*# Boeing Commercial Airplane Co., Seattle, Wash.
A STUDY OF THE EFFECTS OF LONG-TERM EXPOSURE TO FUELS AND FLUIDS ON THE BEHAVIOR OF ADVANCED COMPOSITE MATERIALS Final Report
E. Y. Tanimoto Aug. 1981 40 p ref
(Contract NAS1-12428)
(NASA-CR-165763; D6-41185-9) Avail: NTIS HC A03/MF A01 CSCL 11D

The periodic testing and evaluation of graphite/epoxy and Kevlar/epoxy material systems after subjecting test specimens to prolonged exposure to several laboratory-controlled environments deemed typical of normal aircraft operations is discussed. It is noted that specimen immersion in water or water-based fluids resulted in the greatest effect on the mechanical properties tested. Also, the environmental fluids showed a tendency to affect Kevlar/epoxy systems at an earlier exposure period than the graphite/epoxy systems. Results also indicate mechanical property strength retention generally being lower for the Kevlar/epoxy systems when compared to the corresponding graphite/epoxy systems in similar environments, after prolonged exposure. B.W.

N82-18349# Naval Weapons Center, China Lake, Calif.
FUEL-RICH PLUME COMBUSTION Annual Progress Report, 1 Oct. 1980 - 30 Sep. 1981
K. C. Schadow, M. J. Lee, and K. C. Wilson 30 Sep. 1981 7 p refs
(AD-A108136) Avail: NTIS HC A02/MF A01 CSCL 21/2

Experiments are being performed using an axisymmetric gas generator ramjet. Axial and radial profiles of pressure, velocity, turbulence intensity, temperature, and species concentration are being determined using non-interference optical diagnostic techniques (laser Doppler velocimeter (LDV)) and intrusive probes. The experimental data are being compared with analytical models developed by Science Application, Inc. (SAI) under an Air Force Office of Scientific Research (AFOSR) contract. An axisymmetric, 5-inch diameter laboratory ramjet combustor was built and checked out. Experiments were initiated using (1) an LDV and a hot-wire anemometer for velocity and turbulence intensity measurements, (2) coated thermocouples for temperature measurement, and (3) a gas chromatograph for analysis of gas samples. GRA

N82-18419# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsberetch.
ELECTROFORMING OF SPACE AND AIRCRAFT STRUCTURES
R. Suchentrunk 1981 9 p refs
(MBB-BB-491-O) Avail: NTIS HC A02/MF A01

Application of electroforming, a production technique for complicated structures, to aircraft and spacecraft structures and components is addressed. The process of electrodeposition is described and the advantages of the electroformed structures are highlighted. Materials suitable for the mandrels and for electrodeposition are discussed emphasizing preferred properties. J.M.S.

N82-18464# Rome Air Development Center, Griffiss AFB, N.Y.
TM/TE POLARIZATION RATIOS IN A SAMPLE OF 30 kHz SFERICS RECEIVED AT ALTITUDES FROM 0 TO 70 km
R. P. Harrison, E. A. Lewis, J. B. Donohoe (Megapulse, Inc.), and J. E. Rasmussen Aug. 1981 17 p refs
(AF Proj. 4600)
(AD-A108182; RADC-TR-81-235) Avail: NTIS HC A02/MF A01 CSCL 20/14

A rocket-borne payload, carrying both veritcal and horizontal magnetic dipole antennas and receiving instrumentation, was flown from Wallops Island, Virginia, to observe the Transverse Electric (TE) and Transverse Magnetic (TM) polarization components of individual sferics at 30 kHz. During the 2-1/2 min flight to apogee at 96 km, 293 individual sferics were observed. Upon applying corrections for difference in azimuthal antenna patterns, it was concluded that the TM noise fields were larger than the

TE fields by about 15 dB near the ground, and approximately equal at 60 km. Author (GRA)

N82-18471# Strategic Air Command, Offutt AFB, Nebr. Aircraft Engineering Div.
AN/ALQ-136 TAIL WARNING SYSTEM FOLLOW-ON OPERATIONAL TEST AND EVALUATION Final Report
Vincent M. Jenkins 23 Nov. 1981 5 p
(AD-A108348; SAC/LGME-P-405) Avail: NTIS HC A02/MF A01 CSCL 15/3

This is a study of the reliability and maintainability of the tail warning system (TWS) AN/ALQ-153. This TWS is a solid state pulsed Doppler radar designed to provide warning and initiate countermeasures against threats attacking from the tail of B-52G/H aircraft. Author (GRA)

N82-18483# European Space Agency, Paris (France).
VOLUMETRIC PATTERN PREDICTION OF ANTENNAS ON AIRCRAFT USING THE GEOMETRICAL THEORY OF DIFFRACTION Ph.D. Thesis - Kaiserslautern Univ.
Thomas Jenk Oct. 1981 146 p refs Transl. into ENGLISH of "Bestimmung des raeumlichen Strahlungsdiagramms von Antennen auf Flugzeugen mittels der geometrischen Beugungstheorie", Rept. DFVLR-FB-80-01 DFVLR, Oberpfaffenhofen, West Germany, Nov. 1979
(ESA-TT-677; DFVLR-FB-80-01) Avail: NTIS HC A07/MF A01; DFVLR, Cologne DM 29,90

High frequency radiation patterns of aircraft dipole and slot antennas are calculated using the geometrical theory of diffraction (GTD). A mathematical model of an aircraft is presented. Arbitrary pattern sections are obtained by solving the ray tracing problem for rays which contribute significantly to the total field. Storage techniques and integration methods for the ray tracing problem (a boundary value problem) are discussed. Comparison with measured results obtained from physical models validate the use of the GTD and model. Author (ESA)

N82-18493* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
APPARATUS FOR DAMPING OPERATOR INDUCED OSCILLATIONS OF A CONTROLLED SYSTEM Patent
John W. Edwards and John W. Smith, inventors (to NASA) Issued 3 Nov. 1981 13 p Filed 29 Feb. 1980 Supersedes N80-20488 (18 - 11, p 1409)
(NASA-Case-FRC-11041-1; US-Patent-4,298,833;
US-Patent-Appl-SN-126064; US-Patent-Class-318-561;
US-Patent-Class-318-620; US-Patent-Class-318-621;
US-Patent-Class-318-622) Avail: US Patent and Trademark Office CSCL 09C

Flight control-related apparatus for damping operator induced oscillations of a controlled system responding to an operator controlled signal is described. The device utilizes a lag-lead filter for frequency and amplitude estimation of the control input, and a rectification and smoothing filter for producing a signal proportional to the absolute value of the frequency and amplitude estimate for use in suppression of the control system output signal. In one embodiment, this is accomplished by computing a correction signal in a correction generating section. In a second embodiment, a second rectification and smoothing filter produces a signal proportional to the absolute value of the controlled input signal. A ratio of the outputs of the first and second rectification and smoothing filters is then used in a generator to generate a gain factor k sub q for the control system to reduce the gain of the output signal of the control system, thereby to provide a damped control output signal without rate limiting the controlled element.

Official Gazette of the U.S. Patent and Trademark Office

N82-18503 Royal Aircraft Establishment, Farnborough (England).
A DESIGN FOR A 32-CHANNEL MULTIPLEXER
P. F. Martinson 26 Jan. 1981 35 p refs
(RAE-TM-RAD-NAV-145; BR77700) Copyright. Avail: Issuing Activity

A time scan analog system multiplexer used for recording data during flight trials of unmanned aircraft navigation sensors is described. The 32 inputs are buffered, then multiplexed in groups of 8 onto 4 lines. These four are multiplexed onto one line and the signal passes through the output buffer to the recorder. Aircraft attitude, heading and height are recorded. Signals from a camera and a kinetheodolite tracking system are synchronized. Operating conditions were simulated using a helicopter. Noise and drift are due to the recorder. The multiplexer copes well with signals of several kHz bandwidth (raw data) and signals of a few Hz bandwidth (processed data, test signals). It can be used with any multitrack tape recorder having an FM recording format on at least two tracks. It can be converted for use in a digital telemetry system. Author (ESA)

N82-18562# Thermo Electron Corp., Waltham, Mass.
OPEN-CYCLE VAPOR COMPRESSION HEAT PUMP Annual Progress Report, 1980
Ravi Sakhuja and Frederick E. Becker 5 May 1981 54 p
(Contract GRI-5011-342-0094)
(PB82-110503; TE4224-243-81; GRI-80/0064) Avail: NTIS HC A04/MF A01 CSCL 13A

Recovery and upgrading of low-grade steam or waste heat sources offers a great potential of energy conservation. Thermo Electron is developing an open cycle vapor compression steam heat pump to meet this objective. The system utilizes excess low-pressure steam or that produced from an industrial excess heat source with a waste heat boiler and compresses this steam to the desired pressure level for process use. The compressor is driven by a prime mover such as a gas turbine, gas engine, etc. The prime mover exhaust heat also can be recovered to generate additional process steam. The fuel consumption of this system can be as low as 30 to 50 percent in comparison to a direct-fired boiler over the expected range of process conditions. Simple payback periods as low as one year can be achieved. GRA

N82-18612*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METAL HONEYCOMB TO POROUS WIREFORM SUBSTRATE DIFFUSION BOND EVALUATION
A. Vary, P. E. Moorhead, and D. R. Hull 1982 12 p refs Presented at the Spring Conf. of the Am. Soc. for Nondestructive Testing, Boston, 22-25 Mar. 1982
(NASA-TM-82793; E-959) Avail: NTIS HC A02/MF A01 CSCL 14D

Two nondestructive techniques were used to evaluate diffusion bond quality between a metal foil honeycomb and porous wireform substrate. The two techniques, cryographics and acousto-ultrasonics, are complementary in revealing variations of bond integrity and quality in shroud segments from an experimental aircraft turbine engine. S.L.

N82-18629# Purdue Univ., Lafayette, Ind. School of Aeronautics and Astronautics.
A COMPILATION OF STRESS INTENSITY FACTOR SOLUTIONS FOR FLAWED FASTENER HOLES Final Report, Jun. 1978 - Aug. 1981
A. F. Grandt, Jr. and T. E. Kullgren (US Air Force Academy) Nov. 1981 86 p refs
(AF Proj. 2307; AF Proj. 2418)
(AD-A108753; AFWAL-TR-81-4112) Avail: NTIS HC A05/MF A01 CSCL 20/1

Several sets of stress intensity factor solutions are provided for through-the-thickness, corner, and surface flawed holes. Results are given for both remote tensile and crack face pressure loading. It is suggested that the crack face pressure solutions can be used with the linear superposition method to analyze many other practical crack problems. The superposition technique is demonstrated with several sets of example calculations. Author (GRA)

N82-18803*# Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
AIRCRAFT MEASUREMENTS AND ANALYSIS OF SEVERE STORMS: 1976 FIELD EXPERIMENT Final Report
P. C. Sinclair Feb. 1982 101 p refs
(Grant NsG-5105)
(NASA-CR-168519) Avail: NTIS HC A06/MF A01 CSCL 04B

Severe storm aircraft measurements are documented, as well as the instrumentation and operational features of aircraft mobility capabilities. The measurements and data analyses indicate that the concept of a highly mobile research aircraft capability for obtaining detailed measurements of wind, temperature, moisture, spherics, etc., near and within severe storm systems, forecast 48 hours in advance in a 1000 nm operating radius, is feasible, and was successfully demonstrated. The measurements and analyses reveal several severe storm features and insights with respect to storm air flow circulations and inflow-outflow

ELEMENT APPROACH AND MEASUREMENT BY GROUND VIBRATION TEST
D. Ludwig *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 23 p refs

Avail: NTIS HC A99/MF A01
The mass and stiffness matrices for a rotating blade are established by the finite element method. The formulation is based on the Lagrange function for combined flapwise bending, chordwise bending, and torsion of twisted nonuniform rotor blades. The element matrices are created by the non-numeric computer program REDUCE. An ordering scheme was introduced to demonstrate which terms may be simplified or neglected. As examples, eigen analyses, with the finite element computer program, are performed for a homogeneous beam and for the nonrotating blade of a wind energy converter. The results of the calculations for the beam are compared with the analytical solutions. The rotor blade of the wind energy converter was tested in a ground vibration test. A short description of the ground vibration test technique and performance is given. N.W.

N82-18129# Westland Helicopters Ltd., Yeovil (England). Dynamics Dept.
A STUDY OF THE TECHNIQUES OF DYNAMIC ANALYSIS OF HELICOPTER TYPE STRUCTURES
G. M. Venn and D. J. Boon *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 21 p

Avail: NTIS HC A99/MF A01
The techniques used in the dynamic analysis of helicopter type structures using finite elements are discussed. A test structure was designed and built which incorporated many design features found in helicopter structures. Experiments were performed on this structure to determine the natural frequencies and normal modes. These experimental results were compared with theoretical finite element results. Altering the build state added one or two extra problems so that these could be studied. The modelling problems investigated were: riveted panel-stringer constructions, deep fabricated beams, discontinuous load paths, bolted joints, honeycomb panels, gearboxes, engine mounts, and engines. The techniques used to model these features are discussed. Problems were found when attempting to compare the theoretical and experimental results. N.W.

N82-18130# Virginia Polytechnic Inst. and State Univ., Blacksburg.
THE EFFECTS OF SLIGHT NON-LINEARITIES ON MODAL TESTING OF HELICOPTER-LIKE STRUCTURES
D. J. Ewins (Imperial College of Science and Technology) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 11 p refs

Avail: NTIS HC A99/MF A01
A comprehensive series of modal tests was made on a specially built test piece designed to simulate many of the characteristics of helicopter structures. These tests identified the presence of a 'slight' degree of nonlinearity and further established that this almost unnoticed effect causes significant discrepancies in the modal properties deduced from measured data. However, systematic analysis of the measurements may be used to isolate the nonlinear effects and to eliminate them from the results. Author

N82-18131# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
PARAMETRIC STUDY OF THE INFLUENCE OF THE ENGINE UPON THE OPERATING COST OF A CIVIL HELICOPTER

Gilbert Beziac, Jean-Pierre Dedieu, and Philippe Cabrit *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 5 p
Avail: NTIS HC A99/MF A01
The influence of engine characteristics (weight, fuel consumption, price, power range) upon the helicopter operating cost were studied. The parametric relationship between the various factors were defined. Several engine alternatives for a medium weight helicopter were compared. The following conclusions were made: (1) a sufficient power reserve is necessary but too high a value is not profitable; (2) the fuel consumption should be the result of a compromise: interest of a low value, engine complexity, reliability; and (3) a substantial increase in helicopter cost effectiveness is obtained thanks to a simultaneous evolution of aircraft and engine. M.D.K.

N82-18132# Technische Hogeschool, Delft (Netherlands). Dept. of Aerospace Engineering.
PREDICTION OF OFF-DESIGN PERFORMANCE OF TURBO-SHAFT ENGINES A SIMPLIFIED METHOD
H. Wittenberg *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p refs

Avail: NTIS HC A99/MF A01
Estimation of the off-design performance of a given gas turbine is generally based on detailed performance characteristics of compressor and turbine(s). An approximate method for the estimation of the off-design behavior of turbojet and turbofan engines was developed using thermodynamic relationships only. The method is based on a matching procedure with generalized mass flow characteristics of the turbine(s) or exhaust nozzle(s). The method was adopted to turbo-shaft engines for this study. Examples are given for an actual engine type. There is fair agreement between the calculated off-design performance and the data derived from the manufacturer's engine brochure. M.D.K.

N82-18133# Rolls-Royce Ltd., Watford (England).
MEASUREMENT TECHNIQUES USED TO ASSESS THE INSTALLED POWER OF A HELICOPTER ENGINE
T. G. Morton *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p Original contains color illustrations

Avail: NTIS HC A99/MF A01
To improve helicopter performance predictions, it is important to quantify any change in engine performance between the test bed and 'as installed' in the aircraft, and to attribute the reasons for any change as accurately as possible. Measurement techniques used to quantify performance for a particular Rolls-Royce Gem Engine installation is discussed. Extra sensors were added to engines in a production Lynx helicopter which was fitted with recorder equipment in the cabin and flown to a defined schedule. If the engine is considered as a thermodynamic unit, the input/output equation must balance. Test point data based on these inlet and exhaust conditions were obtained from both test bed and flight tests. Analysis of results when compared to a thermodynamic model of the engine, shows that the resultant data is very sensitive to the quality of measurements and will quickly show the deviation from predicted characteristics. Author

N82-18134# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
COMPONENT DESIGN AND DEVELOPMENT FOR FUTURE HELICOPTER ENGINES
Jean Hourmouziadis and Horst B. Kreiner *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs
Avail: NTIS HC A99/MF A01
Advances achieved today and results available from both rig and demonstrator test programs for present and future helicopter engines are discussed. These will form the basis for further component improvement required to yield a successful next generation engine. The significance of reduced fuel consumption, improved overall system performance, and reliability are considered in relation to design activity and reaction to changing customer needs. M.D.K.

N82-18135# General Electric Co., Cincinnati, Ohio. Systems and Controls.
THREE-ENGINE CONTROL SYSTEM FOR THE PROTOTYPE EH-101 HELICOPTER
E. A. Chiuchiolo and J. J. Curran *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft 1981 10 p refs

(AEBG-9/81-1568L) Avail: NTIS HC A99/MF A01
The T700 control system configured for installation in the three-engined WG.34A helicopter (prototype for European Helicopter Industries EH-101) provides for a versatile control system which may be operated normally to provide the helicopter propulsion or may be operated as a totally independent system to power airframe avionics and power accessories. It is designed to maintain constant speed for accessories or load share with second and third engines and is independent of position in the aircraft. The total system is automatic and provides not only constant rotor speed but also closely matched torques. Modifica-

tions made to the T700 control system to provide the above capabilities are discussed. Discussion of the need for these modifications and the present status of the design is also designed. Author

N82-18136# I.A.M. Rinaldo Piaggio, Finale Ligure (Italy).
ENGINE SUPERFICIAL TEMPERATURE AND INFRARED SIGNATURE
A. M. Ricci, A. N. Allavena, and W. Esposti (I.C.I.T.E., S. Giuliano Milanese, Italy) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p

Avail: NTIS HC A99/MF A01

A system calibration and data processing method was set up to provide spatial information on temperature and a spatially accurate radiant intensity map under different angles. The methodology was developed to evaluate the thermal exchange between engine and engine-cowling and their infrared signature in the 1 - 6 micrometer range in order to evaluate special infrared treatment to reduce infrared emission. The infrared imagery camera was coupled to an analogic/digital data acquisition system. Calibration studies were conducted in an infrared laboratory to provide the absolute calibration on the thermograph in the previously defined spectral range. The results are presented in profiles of temperature and radiance. Author

N82-18137# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
POINT OF VIEW OF A HELICOPTER MANUFACTURER ON AIRWORTHINESS REGULATIONS
Jean Boulet *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 5 p

Avail: NTIS HC A99/MF A01

Helicopter airworthiness regulations are discussed. The need for airworthiness regulations to be drafted and modified through a process of constant consultation between Civil Aviation Authorities and manufacturers is discussed. The need to introduce the concept of probability to be able to come closer to the actual risks and to avoid penalizing aircraft with useless systems and demonstration requirements is also considered. It is suggested that these regulations tend toward one single international set of regulations and one single demonstration of compliance with the regulations. The possibility of reconciling a continuously improved safety level and a progressive reduction in helicopter costs is also considered. M.D.K.

N82-18138# Italian Army General Staff, Rome.
MILITARY REQUIREMENTS: TOO LITTLE OR TOO MUCH
Emidio Valente *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 18 p

Avail: NTIS HC A99/MF A01

Concepts useful for a better understanding of the military requirements, operational requirements for helicopters are discussed. The need for an understanding between military operators of rotary-wing aircraft, helicopter designers, and manufacturers is considered. Two viewpoints are summarized: (1) The helicopter is a weapon system featuring the same indispensability level of all other systems required to integrate the battlefield. (2) The helicopter must be designed to reflect military requirements which cover all those elements likely to condition its operation, this is to say: operational environment, human factor, and economical aspects. The following considerations are recommended for further investigation: (1) whether commercial operators are really affected and (2) whether solutions can be found which in the end prove to be a saving rather than a deterioration in cost, weight and complexity. M.D.K.

N82-18139# Italian Air Force Pratica di Mare, Rome. Flight Test Centre.
PARAMETRIC CRITERIA AND IMPACT ON DESIGN TRENDS
Roberto dePompeis and Fulvio Gagliardi (Ministry of Defence) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 25 p refs

Avail: NTIS HC A99/MF A01

Laws or trends of typical parameters which contribute to the definition of an 'ideal' specific helicopter which can be used as a reference model and give a nondimensional measure of effectiveness are discussed. Operative requirements, taking into account the main factors affecting missions were transferred into a mathematical model. The procedure was derived from theoretical studies already applied to aircraft selections and consists of three main steps: (1) Effectiveness program; (2) Total operating cost estimation; and (3) Evaluation of effectiveness-cost ratio and optimization of the fleet selection. All costs (manufacturing, maintenance, training, operating, etc.) for the operative life are estimated with a similar methodology and lead to the determination of the effectiveness-cost ratio which may be optimized taking into account the fleet consistency required to fulfill the task. M.D.K.

N82-18140# Hughes Helicopters, Culver City, Calif.
DESIGN PHILOSOPHY OF THE HUGHES MODEL 600 HELICOPTER
R. S. Taylor *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p

Avail: NTIS HC A99/MF A01

The design philosophy of a new model helicopter, the Hughes model 600X, which took into consideration a number of factors is discussed. The following subjects are discussed and a rationale for the selected approach is given: (1) whether to grow or develop a totally new configuration. To be cost effective, a growth helicopter would need to produce significant additional advantages which would be offset by the ever present compromises of the old design; (2) how to grow an 'egg', especially one with internal structure; (3) how to replace the old model or is the new model to be produced in addition to the old one; and (4) how is the market potential to be assessed. Details of approaches are presented with reasons for accepting or rejecting each one. Results of market analysis and response of the helicopter public is presented to show the viability of the selected configuration. M.D.K.

N82-18141# United Technologies Corp., East Hartford, Conn. Aircraft Div.
SH-60B TEST PROGRAM
Frederick J. Silverio *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p

Avail: NTIS HC A99/MF A01

The SEAHAWK Program, a successful helicopter development program, is discussed in detail. The following program tests are described: modifications for shipboard compatibility and mission requirements; preflight ground tests; flight and shakedown testing; evaluation of the pitot-static system and digital computer system; reliability tests and component systems analysis. Failure modes not detected in flight tests or qualifications bench tests, but discovered in testing under service use, are discussed. M.D.K.

N82-18142# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
NAVAL VERSIONS OF THE DAUPHIN AND THE AS 15 TT WEAPON SYSTEM
J. P. Dubreuil *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 10 p

Avail: NTIS HC A99/MF A01

Aerospatiale's Dauphin II helicopter family, initially intended to satisfy civil market demand, is presently subject to development that makes it possible to derive military versions from it. The equipment specific to naval versions whose basic system is the AS 15 TT is discussed in detail. All the arrangements and modifications that were necessary to adapt the N aircraft to naval, rescue and attack missions and which led to the SA 365 F version are discussed. The AS 15 TT and surface vessel system are described in detail. The modifications which affected almost all the constitutive elements and aimed at improving not only performance but also maintenance led to a reduction in fabrication and operation costs. M.D.K.

N82-18143# Westland Helicopters Ltd., Yeovil (England).
ARMY LYNX: PRODUCT DEVELOPMENT MATCHED TO MILITARY COMBAT DEVELOPMENT
D. A. S. Howell *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p

Avail: NTIS HC A99/MF A01

The Lynx helicopter program to date and planned product orientation. Precipitation downdraft air is recirculated back into the updraft core below the scud cloud in both back and front feeder type storms. In a back feeder type storm, the downdraft outflow air ahead of the storm is also recirculated back into the updraft region near cloud base. S.L.

N82-18836# National Oceanic and Atmospheric Administration, Boulder, Colo.

DEVELOPMENT OF A CLEAR AIR RADAR TO DETECT METEOROLOGICAL HAZARDS AT AIRPORTS Final Report, 1 Oct. 1978 - 21 Sep. 1981

R. B. Chadwick, K. P. Moran, W. C. Campbell, K. B. Earnshaw, and T. R. Detman 21 Sep. 1981 113 p refs
(Contract ESD-0-0630; AF Proj. 6670)
(AD-A108238; AFGL-TR-81-0268) Avail: NTIS HC A06/MF A01 CSCL 17/9

To be useful in detecting meteorological hazards such as low-level wind shear near airports, a radar must be able to: (1) detect backscatter from both clear air and rain; (2) operate at short ranges and low elevation angles; and (3) measure Doppler frequencies caused by air motion. The development of a radar with these characteristics is described and the results of testing this radar at airports are presented. Special emphasis is placed on the problems of low elevation angle operation and clutter suppression. The importance of proper siting is pointed out. In addition, it is demonstrated that the radar can readily detect the turbulent wakes of large jet aircraft. Author (GRA)

N82-18920# Naval Research Lab., Washington, D. C. Computer Science and Systems Branch.

A-7E SOFTWARE MODULE GUIDE Interim Report

K. H. Britton and D. L. Parnas 8 Dec. 1981 36 p refs
(AD-A108649; NRL-MR-4702) Avail: NTIS HC A03/MF A01 CSCL 09/2

This document describes the basic organization of NRL's version of the A-7E onboard flight software. The report describes a structure in which modules have been designed in accordance with the Information Hiding Principle. Because of the larger number of modules that result when this principle is applied, the modules are arranged in a hierarchy. The hierarchy should simplify the task of a maintenance programmer assigned to make a specific modification. The document also describes the principles used in the design of the software. It is intended to be useful both as a guide to the A-7E software and as a model for those developing other software systems. Author (GRA)

N82-18922# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.

A PROGRAM TESTING ASSISTANT

David Chapman Nov. 1981 25 p refs
(Contract N00014-80-C-0505)
(AD-A108147; AI-M-651) Avail: NTIS HC A02/MF A01 CSCL 09/2

This paper describes the design and implementation of a program testing assistant which aids a programmer in the definition, execution and modification of test cases and executes them automatically when appropriate. It modifies test cases to preserve their usefulness when the program they test undergoes certain types of design changes. The testing assistant acts as a fully integrated part of the programming environment and cooperates with existing programming tools, including a display editor, compiler, interpreter, and debugger. Author (GRA)

N82-18995*# Modern Analysis, Inc., Ridgewood, N. J.

STUDY OF CABIN NOISE CONTROL FOR TWIN ENGINE GENERAL AVIATION AIRCRAFT

R. Vaicaitis and M. Slazak Hampton, Va. NASA. Langley Research Center Feb. 1982 147 p refs
(Contract NAS1-16117)
(NASA-CR-165833; MAI-1) Avail: NTIS HC A07/MF A01 CSCL 20A

An analytical model based on modal analysis was developed to predict the noise transmission into a twin-engine light aircraft. The model was applied to optimize the interior noise to an A-weighted level of 85 dBA. To achieve the required noise attenuation, add-on treatments in the form of honeycomb panels, damping tapes, acoustic blankets, septum barriers and limp trim panels were added to the existing structure. The added weight of the noise control treatment is about 1.1 percent of the total gross take-off weight of the aircraft. B.W.

N82-1[illegible]*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ANNOYANCE CAUSED BY PROPELLER AIRPLANE FLYOVER NOISE: PRELIMINARY RESULTS

David A. McCurdy and Clemens A. Powell Dec. 1981 35 p refs
(NASA-TM-83244) Avail: NTIS HC A03/MF A01 CSCL 20A

The annoyance response of people to the noise of propeller airplane flyovers was examined. The specific items of interest were: (1) the annoyance prediction ability of current noise metrics; (2) the effect of tone corrections on prediction ability; (3) the effect of duration corrections on prediction ability; and (4) the effect of 'critical band' corrections on the prediction ability of perceived noise level. Preliminary analyses of the data obtained from two experiments are presented. The first experiment examined 11 propeller airplanes with maximum takeoff weights greater than or equal to 5700 kg. The second experiment examined 14 propeller airplanes weighting 5700 kg or less. Also included in each experiment were five different commercial service jet airplanes. Each airplane noise was presented at D-weighted sound pressure levels of 70, 80, and 90 dB to subjects in a testing room which simulates the outdoor acoustic environment. Subjects judged 108 stimuli in the first experiment and 132 stimuli in the second experiment. Perceived noise level predicted annoyance better than A, D, or E-weighted sound pressure level. Corrections for tones greater than of equal to 500 Hz generally improved prediction ability for the heavier propeller airplanes. B.W.

N82-19084*# National Aeronautics and Space Administration, Washington, D. C.

NASA POCKET STATISTICS

Jan. 1982 70 p
(NASA-TM-84134) Avail: NTIS HC A04/MF A01 CSCL 05A

NASA program goals and objectives, major mission performance, USSR space flights, comparisons of the USA and USSR space records, and selected technical, financial, and manpower data are summarized. N.W.

N82-19132*# National Aeronautics and Space Administration, Washington, D. C.

BIBLIOGRAPHY OF NASA PUBLISHED REPORTS ON GENERAL AVIATION, 1975 TO 1981

Jun. 1981 277 p
(NASA-TM-83307) Avail: NTIS HC A13/MF A01 CSCL 01B

This bibliography lists 478 documents which relate to all heavier-than-air fixed wing aircraft exclusive of military types and those used for commercial air transport. An exception is the inclusion of commuter transport aircraft types within the general aviation category. NASA publications included in this bibliography are: conference publications (CP), reference publications (RP), technical memorandums (TM, TMX), technical notes (TN), technical papers (TP), and contractor reports (CR). In addition, papers and articles on NASA general aviation programs published by technical societies (AIAA, SAE, etc.) are included, as well as those listed in NASA's Scientific and Technical Aerospace Reports (STAR) Journal. Author and subject indexes are also provided to facilitate use of the bibliography. T.M.

N82-19134*# National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.

ELECTRIC FLIGHT SYSTEMS

Nelson J. Groom, ed. and Ray V. Hood, ed. Feb. 1982 289 p Proceedings of workshop held in Hampton, Va., 9-10 Jun. 1981
(NASA-CP-2209; L-14965) Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating presentations on the development of electric flight systems for the all-electric aircraft and for spacecraft are presented.

N82-19135*# Lockheed-California Co., Burbank.

ELECTRIC FLIGHT SYSTEMS, OVERVIEW

Michael J. Cronin *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 61-94

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on electric flight systems are presented. Fuel consumption, the power plant assembly, flight control technology, electromechanical actuator systems and components of possible power systems are surveyed. J.D.H.

N82-19136*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
A PROPULSION VIEW OF THE ALL-ELECTRIC AIRPLANE
Robert P. Wagner *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 95-102

Avail: NTIS HC A12/MF A01 CSCL 21E

Materials illustrating a presentation on electric propulsion systems are presented. The electric engine and engine/generator configurations are described and NASA's role outlined. J.D.H.

N82-19137*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.
POTENTIAL PROPULSION CONSIDERATIONS AND STUDY AREAS FOR ALL-ELECTRIC AIRCRAFT
Thomas G. Lenox *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 103-112

Avail: NTIS HC A12/MF A01 CSCL 21E

Materials illustrating a presentation on all-electric aircraft propulsion systems are presented. Propulsion system impacts on aircraft design and areas requiring further study are outlined. J.D.H.

N82-19138*# Westinghouse Electric Corp., Lima, Ohio. Air All-Electronics Div.
A LOOK INTO THE FUTURE: THE POTENTIAL OF THE ALL-ELECTRIC SECONDARY POWER SYSTEM FOR THE ENERGY EFFICIENT TRANSPORT
Alan E. King *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 113-124

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on the all-electric aircraft power system are presented. The advantages of the system and the planning time table are outlined. J.D.H.

N82-19139*# Sundstrand Aviation-Rockford, Ill.
THE 400-HERTZ CONSTANT-SPEED ELECTRICAL GENERATION SYSTEMS
Richard McClung *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 125-146

Avail: NTIS HC A12/MF A01 CSCL 09C

Materials illustrating a presentation on 400 Hz constant speed generation systems are presented. The system features are outlined, components and functioning described, and display graphics illustrated. J.D.H.

N82-19140*# AiResearch Mfg. Co., Torrance, Calif.
ELECTRIC ECS
Dale O. Moeller *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 147-154

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on electric environmental control systems for electric flight systems are presented. Requirements are outlined and schematics presented. J.D.H.

N82-19141*# Hamilton Standard, Windsor Locks, Conn.
ENVIRONMENTAL CONTROL SYSTEMS
Fred M. Rosenbush *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 155-182

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on environment control systems for electric flight systems are presented. Schematics and flow diagrams of fresh air source and air conditioning systems, and vapor cycle and air cycle parts lists are presented. J.D.H.

N82-19142*# Honeywell, Inc., Clearwater, Fla.
OVERVIEW OF HONEYWELL ELECTROMECHANICAL ACTUATION PROGRAMS
Charles Wyllie *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 183-197

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on electromechanical actuation programs (EMA) are presented. The development history is outlined. Space shuttle flight control systems and the advantages of EMAS, and EMA technology status and development requirements are outlined. J.D.H.

N82-19143*# Rockwell International Corp., Cedar Rapids, Iowa.
DIGITAL FLIGHT CONTROLS
John C. Hall *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 199-212

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on digital flight controls for electric flight systems are presented. System architecture and design criteria are outlined, and components described. J.D.H.

N82-19144*# Boeing Commercial Airplane Co., Seattle, Wash.
ELECTRIC FLIGHT SYSTEMS
C. William Clay *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 213-234

Avail: NTIS HC A12/MF A01 CSCL 09C

Materials used to illustrate a presentation on the development of electric flight systems are presented. Systems concepts are outlined. J.D.H.

N82-19145*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ENGINE TECHNOLOGY
Anthony C. Hoffman *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 235-240

Avail: NTIS HC A12/MF A01 CSCL 21E

Materials used in a presentation on development of engine technology for electric flight systems are presented. Component and system technology issues, NASA's role, and flight test requirements are outlined. J.D.H.

N82-19146*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
POWER SYSTEMS
Robert Finke *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 241-248

Avail. NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation of the development of power systems are presented. The technology issues and tradeoffs, the role of NASA, and testing requirements are outlined. J.D.H.

N82-19148*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ELECTROMECHANICAL ACTUATORS
James Bigham *In* NASA. Langley Research Center Elec. Flight Systems Feb. 1982 p 253-258

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on the development of electromechanical actuators (EMA) for electric flight systems are presented. Technology issues are identified, and major steps relative to EMA development, NASA's role, and a technology procurement plan are outlined. J.D.H.

N82-19149*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DIGITAL FLIGHT CONTROLS
Billy Dove *In its* Elec. Flight Systems Feb. 1982 p 259-261

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating the presentation on digital flight controls are presented. Technology issues, the role of NASA, and steps in the development of flight controls are outlined. J.D.H.

N82-19150*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ELECTRIC FLIGHT SYSTEMS INTEGRATION
Ray V. Hood *In its* Elec. Flight Systems Feb. 1982 p 263-288

Avail: NTIS HC A12/MF A01 CSCL 01C

Materials illustrating a presentation on the integration of development related to the evolution of military combat thinking especially the anti-armour role are presented. The background for this product development is the impact of technology in the areas of materials, sensors, armaments and systems, both in the context of the helicopter as a total weapon system and the development of air defense systems that pose a threat to the helicopter in the battlefield scenario. Author

N82-18144# Societe Nationale Industrielle Aerospatiale, La Courneuve (France).

A LIGHT HELICOPTER FOR NIGHT FIRING

J. F. Candau *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 18 p

Avail: NTIS HC A99/MF A01

Structural design criteria and armament system requirements for a flight combat helicopter for night firing are discussed. Helicopter characteristics and performance requirements for night time antitank missions are considered. The following areas of consideration are discussed: piloting, navigation, target seeking, and firing. Operational use, crew organization, and program development are also reviewed. M.D.K.

N82-18145# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).

TETHERED ROTORPLATFORMS AND THEIR MISSION POTENTIAL

W. Goeller *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 13 p

Avail: NTIS HC A99/MF A01

A definition of tethered rotorplatforms is given and the main objectives that are pursued with these vehicles are presented. A short retrospect on rotorplatform history is given. The Dornier 'Kiebitz' is described. It is designed to lift payloads for battlefield surveillance, air defense, EW or communication to some hundred meters above ground for long mission times. A very small tethered rotorplatform for elevating electro optical sensors of 5 to 10 kg is described. The energy for its flight time of about 70 seconds is stored in a massive momentum ring surounding its rotor. Finally, a proposed rotorplatform with an electric drive system for payloads of about 30 kg for target acquisition and target designation, is also discussed. M.D.K.

N82-18146# Southampton Univ. (England).

WIND TUNNEL INVESTIGATION OF HIGH SPEED ROTOR NOISE

H. Tadghighi and I. C. Cheeseman *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 25 p refs

Avail: NTIS HC A99/MF A01

A high speed model rotor (tip Mach number of 0.75) was developed to investigate tail rotor noise in forward flight conditions. The existing 2.1 by 1.5 m low speed (30 m/sec) closed circuit wind tunnel was modified and utilized to enable acoustic measurements of forward flight to be made. Check tests in the 24 ft anechoic wind tunnel show excellent agreement with the development tests. The model rotor noise data are found to correlate wall with full scale helicopter rotor values. Simultaneously recorded aerodynamic performance of the model rotor (blade loading, steady thrust, torque and trimmed moments) is compared with theoretical aeroacoustic treatments. It is concluded that the model rotor accurately simulates full scale rotor aeroacoustic data. J.M.S.

N82-18147*# Army Research and Technology Labs., Moffett Field, Calif. Aeromechanics Lab.

PREDICTION OF BLADE VORTEX INTERACTION NOISE FROM MEASURED BLADE PRESSURE

Yoshiya Nakamura *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 20 p refs Sponsored by NASA

Avail: NTIS HC A99/MF A01 CSCL 01A

The impulsive nature of noise due to the interaction of a rotor blade with a tip vortex is studied. The time signature of this noise is calculated theoretically based on the measured blade surface pressure fluctuation of an operational load survey rotor in slow descending flight and is compared with the simultaneous microphone measurement. Particularly, the physical understanding of the characteristic features of a waveform is extensively studied in order to understand the generating mechanism and to identify the important parameters. The interaction trajectory of a tip vortex on an acoustic planform is shown to be a very important parameter for the impulsive shape of the noise. The unsteady nature of the pressure distribution at the very leading edge is also important to the pulse shape. The theoretical model using noncompact linear acoustics predicts the general shape of interaction impulse pretty well except for peak amplitude which requires more continuous pressure information along the span at the leading edge. Author

N82-18148# Westland Helicopters Ltd., Yeovil (England).

PRELIMINARY THOUGHTS ON HELICOPTER CABIN NOISE PREDICTION METHODS

J. S. Pollard *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 14 p refs

Avail: NTIS HC A99/MF A01

The problems of predicting helicopter cabin noise are discussed with particular reference to the Lynx helicopter. Available methods such as modal analysis adopted for propeller noise prediction do not cope with the higher frequency discrete tone content of helicopter gear noise, with the airborne and structure-borne noise contributions. Statistical energy analysis methods may be the answer but until these are developed, one has to rely on classical noise transmission analysis and transfer function methods. Author

N82-18149# Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.

THE MEASUREMENT OF THE MOBILITY OF STRUCTURES AT ACOUSTIC FREQUENCIES

Susan M. Damms *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 21 p refs

Avail: NTIS HC A99/MF A01

The development of a technique to measure the response of structures to vibrational input forces and moments is described. So far, simple structures with known properties have been used but it is intended to apply the technique in the design of an interface which isolates vibrationally the gearbox of a helicopter from the cabin at acoustic frequencies. In a first experiment, no moments were applied. The main object was to demonstrate that measurements could be made on two components of a structure with sufficient accuracy to correctly predict measurements on the assembled structure. The two components were a beam and a dynamic absorber. In a second experiment a special block was attached to a beam to enable forces and moments to be applied and translations and rotations to be measured. The particular mobilities measured .were chosen so that they could be easily compared with theory and also with measurements without a block. J.M.S.

N82-18150# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

FLIGHT CHARACTERISTICS DESIGN AND DEVELOPMENT OF THE MBB/KHI BK117 HELICOPTER

H. Huber and T. Masue (Kawasaki Heavy Industries) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 21 p refs

Avail: NTIS HC A99/MF A01

The BK 117 light, twin-engine helicopter was designed to provide high flexibility of operations, attractive performance characteristics, and outstanding handling qualities. Dominant features result from the hingeless rotor system, which provides inherent high control power and high angular velocity damping. Further optimization is achieved through refinement of the fuselage aerodynamic design, and by a proper layout of the empennage configuration, taking into account the interactional aerodynamic phenomena. The particular design features and their impact on the helicopter flight characteristics are described. The results obtained in the areas of static and dynamic stability (longitudinal, lateral directional), control response and maneuver characteristics, aeromechanical stability and loads and vibrations are presented, including correlation of flight test data with computer model simulations. J.M.S.

N82-18151# Politecnico di Milano (Italy). Dipartimento di Ingegneria Aerospaziale.

A GENERAL PURPOSE PROGRAM FOR ROTOR BLADE DYNAMICS

M. Borri, M. Lanz, and P. Mantegazza *In* DGLR Seventh European

Rotorcraft and Powered Lift Aircraft Forum 1981 15 p refs

Avail: NTIS HC A99/MF A01

A computer program for rotor blade dynamics capable of dealing both with hinged and hingless rotors, suitable for steady state flight analysis and stability evaluation was developed. Blade motion is represented by finite elements in the space-time domain, covering the span of one or more rotor revolutions, and allowing for different nonlinearities. This method gives a flexible unitary approach for the very different model complexities required by the different design phases, such as the simplest rigid blade schemes, and the more sophisticated ones including nonlinearities arising from large blade flexibilties and large movements in control links. The aerodynamics, at the present development state, considers prescribed wake geometry and blade element theory, including stall and compressibility effects. J.M.S.

N82-18153# National Aerospace Lab., Amsterdam (Netherlands).

A CONTROL MODEL FOR MANEUVERING FLIGHT FOR APPLICATION TO A COMPUTER-FLIGHT TESTING PROGRAM

H. Haveridings *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p refs

Avail: NTIS HC A99/MF A01

A computer-flight-testing (CFT) program for helicopters to evaluate helicopter dynamics and handling and control qualities is described. The nonlinear six degrees of freedom helicopter model is driven by control inputs generated by a specially developed control model (or 'pseudo pilot') to eliminate problems in estimating control inputs during maneuvering flight. This is an adaptation of a linear optimal control model as used in human factor analysis. The helicopter model is based on two-dimensional strip aerodynamics steady-state rotor blade dynamics using only out-of-plane bending mode shapes, which are suitable for various types of rotor articulation. The 'pilot' model consists of a flight path generation (FPG)-model and a stabilitization (STAB)-model. The FPG-model is based on linearized system dynamics using terminal optimal control, generating both required flight path and the control inputs to achieve it. These controls are input into the helicopter model. The two flight paths are compared, and differences are fed back to the STAB-model to generate corrective control inputs of such a nature that the helicopter-model-generated flight path tracks the required flight path generated by the FPG-model. Also the STAB-model is based on linearized system dynamics. As an example, two flare maneuvers are 'flown', and the results discussed. The pseudo-pilot model performs well, provided that helicopter dynamics do not change much during a specific maneuver. J.M.S.

N82-18154# Westland Helicopters Ltd., Yeovil (England).

THE ROLE OF SIMULATION IN THE DESIGN PROCESS

I. F. Montgomerie and G. C. F. Wyatt *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p

Avail: NTIS HC A99/MF A01

Real-time simulation of helicopters and their avionic systems is discussed. The nature of the problems facing the helicopter and systems designers are reviewed, and the potential benefits accuring from the timely and effective use of simulation are examined. The development of simulation as a design tool over the last two decades are reviewed, and the characteristics of the simulation facilities are described. J.M.S.

N82-18155# Royal Aircraft Establishment, Farnborough (England).

PRELIMINARY INVESTIGATION INTO THE ADDITION OF AUXILIARY LONGITUDINAL THRUST ON HELICOPTER AGILITY

P. J. Legge, P. W. Forestcue (Southampton Univ.), and P. Taylor (Southampton Univ.) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p refs

Avail: NTIS HC A99/MF A01

The agility requirements in specific maneuvers performed by military helicopters are investigated. A simple mathematical simulation of the helicopter accelerating and decelerating longitudinally is used to examine the advantages of auxiliary thrust. For helicopters operating in the Nap-of-Earth environment the longitudinal acceleration and deceleration performance is shown to be uniquely important. Large improvements in agility, measured by a performance function, are obtained by adding auxiliary thrust. The need for the helicopter to change its attitude is drastically reduced, and the pilot workload improved. The type of flight profile used is also examined, using a nondimensional Froude number. There was no benefit in a 'maximum effort' flight profile, which consequently further improves the pilot workload. Auxiliary thrust improved agility performance by increasing the helicopter's ability to change position while maintaining precise attitude control. J.M.S.

N82-18156# National Defence Academy, Yokosuka (Japan). Dept. of Aeronautical Engineering.

OPTIMUM PERFORMANCE AND WAKE GEOMETRY OF CO-AXIAL ROTOR IN HOVER

Tomoari Nagashima and Kenji Nakanishi *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p refs

Avail: NTIS HC A99/MF A01

Numerical studies to clear out the rotor-wake interference effects on the optimum performance and wake geometry of a coaxial rotor in hover are performed using the generalised momentum theory and the simplified free wake analysis. For applying the momentum concept to the performance predictions of the coaxial rotor system, each wake of rotors and flow fields around them are modeled so as to properly incorporate wake contractions, rotational velocities, and nonlinear mutual interference effects. In case of the free wake analysis, it is approximated by a finite number of discrete circular vortices whose numbers and core radii are deduced from the sensitivity analysis. The numerical results clearly show that the performances and its wake geometries are largely dependent on the axial spacings and the pitch differences between rotors and there are unique combinations of them which could produce the optimum performance. It is also understood that the upwash effect of the contracted upper rotor wake on the lower rotor plays a fundamental role to improve the hover performance with coaxial rotor arrangement. Author

N82-18157# Tokyo Univ. (Japan). Inst. of Interdisciplinary Research.

A NUMERICAL APPROACH TO CO-AXIAL ROTOR AERODYNAMICS

Shigeru Saito and Akira Azuma *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs

Avail: NTIS HC A99/MF A01

In the simple momentum theory, the aerodynamic characteristics of the lower rotor of a coaxial rotor system are usually evaluated under the highly deteriorated conditions caused by the fully developed wake of the upper rotor, specifically under the conditions of hovering flight. Analysis using the Local Momentum Theory not only shows the performance of the lower rotor to be higher than that calculated by the simple momentum theory but also makes it possible to calculate the instantaneous airloading of blades operating in a complex wake system. By introducing the radial shrinkage of the rotor wake, the accuracy of the analysis of blade airloading is further improved. The calculated results are compared with those of wind tunnel tests in both hovering and forward flights. In forward flight, the performance of the lower rotor improves not only with increases in the forward speed but also with increase in the vertical distance between the upper and lower rotors. In hovering flight, the improvement in the performance is not remarkable because the lower rotor is strongly influenced by the upper rotor wake. Author

N82-18158# Institut fuer Flugmechanik, Brunswick (West Germany).

HELICOPTER ROTOR DOWNWASH: RESULTS OF EXPERIMENTAL RESEARCH AT THE DFVLR-ROTOR TEST STAND AND THEIR COMPARISON WITH THEORETICAL RESULTS

B. Junker and H.-J. Langer *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 23 p refs

Avail: NTIS HC A99/MF A01

System tests and dynamic researches at the rotor test stand were compared with several downwash measurements to demonstrate the dependency between mathematical parameter values and rotor control values, e.g., thrust, advance ratio, and components and subsystems of electric flight systems are presented. The technology issues are outlined, and near and far term implications of issues affecting the systems integration are outlined. J.D.H.

N82-19154# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
MULTIVARIABLE AIRCRAFT CONTROL BY MANEUVER COMMANDS: AN APPLICATION TO AIR TO SURFACE GUNNERY
Binh DangVu *In its* La Rech. Aerospatiale, Bimonthly Bull. No. 1981-3, May-Jun. 1981 (ESA-TT-714) Oct. 1981 p 9-19 refs Transl. into ENGLISH of "La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-3, May-Jun. 1981" p 149-159

Avail: NTIS HC A05/MF A01; original report in FRENCH available at ONERA, Paris FF 45

Aircraft control where pilot commands are variables directly related to aircraft motion in opposition to deflection angles of control surfaces is described. Linear optimal control theory is applied so as to improve flight qualities and reduce the work load of the pilot. A control system for sideslip, rate of roll, and rate of pitch was tested in numerical simulation and its efficiency for aiming in air-to-surface gunnery was assessed. Results show that control of the rate of pitch is well adapted for cancelling longitudinal aiming devitions, but that control of yaw rate is preferable to roll for cancelling lateral deviations. Another system obtained by integrating the flight control and fire control systems is also suggested. Author (ESA)

N82-19156# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
ELECTRICAL GROUND TESTING OF AIRCRAFT ANTISTATIC PROTECTION
A. Bruere *In its* La Rech. Aerospatiale, Bimonthly Bull. No. 1981-3, May-Jun. 1981 (ESA-TT-714) Oct. 1981 p 47-56 refs Transl. into ENGLISH of "La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-3, May-Jun. 1981" p 187-196

Avail: NTIS HC A05/MF A01; original report in FRENCH available at ONERA, Paris FF 45

Methods of ensuring aircraft protection against electrostatic spurious phenomena are reviewed and a device for ground testing of this protection is described. The equipment provides for checking the surface resistance of antistatic treatments as well as the quality of the electrical connections between the various components of the external structure and the aircraft potential reference point. Problems in electrostatic quality control for aircraft when testing in the presence of a finishing coat of paint are emphasized. The prototype device is depicted while operating and performance principles are explained. Author (ESA)

N82-19158# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
INDUCTION DRIVEN TRANSONIC WIND TUNNEL T2: OPERATION AT ROOM TEMPERATURE AND CRYOGENIC ADAPTATION
A. Mignosi, D. Faulmann, and A. Seraudie *In its* La Rech. Aerospatiale, Bimonthly Bull. No. 1981-3, May-Jun. 1981 (ESA-TT-714) Oct. 1981 p 63-74 refs Transl. into ENGLISH of "La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-3, May-Jun. 1981" p 203-215

Avail: NTIS HC A05/MF A01; original report in FRENCH available at ONERA, Paris FF 45

The transformation of the induction driven wind tunnel T2 (0.4 m X 0.4 m) into a cryogenic intermittent wind tunnel which uses high pressure air as driving gas and nitrogen as coolant is described. The operating mode and optimization of the wind tunnel for low temperature operation are discussed. Theoretical and experimental aspects of the transformed facilities, i.e., modification of the circuit, thermal insulation techniques, liquid nitrogen injection, startup process, cryogenic operating mode, and expected performance, are presented. Author (ESA)

N82-19160# Network Analysis Corp., Vienna, Va.
NATIONAL AIRSPACE DATA INTERCHANGE NETWORK (NADIN) SUPPORT OF REMOTE MAINTENANCE MONITORING SYSTEM (RMMS) Final Report
Dec. 1981 111 p refs
(Contract DOT-FA79WA-4335)
(AD-A109125; NAC/FR-303J/01; FAA-RD-81-109) Avail: NTIS HC A06/MF A01 CSCL 05/2

National Airspace Data Interchange Network (NADIN) architectural enhancements necessary to support the Remote Maintenance Monitoring System (RMMS) and MMS programs are described. Several alternative approaches are formulated. These alternatives are compared and recommendations are made. It is found that: The NADIN backbone has sufficient capacity to handle initial RMMS traffic at adequate performance levels; An X.25 compatible interface for the NADIN and MPS connection is recommended; Additional frame routing capabilities at the NADIN concentrator and front end processors are required; and Future MPS communications will be best served by a fully distributed packet switched NADIN capable of supporting complete X.25 functions. Author (GRA)

N82-19161# Aeronautical Research Labs., Melbourne (Australia).
AERONAUTICAL RESEARCH LABORATORIES STRUCTURES DIVISION Annual Report, 1979 - 1980
F. H. Hooke, ed. Apr. 1981 46 p
(AD-A109049; ARL/STRUC-NOTE-473) Avail: NTIS HC A03/MF A01 CSCL 01/3

This report describes the functions, organization, staffing, unclassified research activities and ad-hoc investigations in progress in the Structures Division, Aeronautical Research Laboratories during the year 1979/80. Author (GRA)

N82-19167*# Boeing Military Airplane Development, Seattle, Wash.
TRANSONIC PERTURBATION ANALYSIS OF WING-FUSELAGE-NACELLE-PYLON CONFIGURATIONS WITH POWERED JET EXHAUSTS
J. C. Wai, C. C. Sun, and H. Yoshihara Feb. 1982 67 p refs
(Contract NAS1-15887)
(NASA-CR-165852) Avail: NTIS HC A04/MF A01 CSCL 01A

A method using a transonic small disturbance code with successive line over-relaxation is described for treating wing/fuselage configurations with a nacelle/pylon/powered jet. Examples illustrating its use for the NASA transport research model are given. Reasonable test/theory comparisons were obtained. Author

N82-19170*# National Aeronautics and Space Administration, Washington, D. C.
NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOPS. VOLUME 1: EXECUTIVE SUMMARY
5 Dec. 1980 115 p refs Workshop held at Palo Alto, Calif., 3-5 Dec. 1980
(NASA-TM-84149) Avail: NTIS HC A06/MF A01 CSCL 01A

This presentation provides an overview of the NASA Rotorcraft Program as an introduction to the technical sessions of the Advanced Rotorcraft Technology Workshop. It deals with the basis for NASA's increasing emphasis on rotorcraft technology, NASA's research capabilities, recent program planning efforts, highlights of its 10-year plan and future directions and opportunities. L.F.M.

N82-19171*# National Aeronautics and Space Administration, Washington, D. C.
NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOPS. VOLUME 2: OPERATORS' VIEWS
5 Dec. 1980 111 p refs Workshop held at Palo Alto, Calif., 2-5 Dec. 1980
(NASA-TM-84148) Avail: NTIS HC A06/MF A01 CSCL 01A

A special panel of helicopter users give presentations in 12 basic areas of helicopter applications. Development of the helicopter and the needs for future growth are discussed. L.F.M.

N82-19172*# National Aeronautics and Space Administration, Washington, D. C.
NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOPS. VOLUME 3: AERODYNAMICS AND STRUCTURES SESSION
4 Dec. 1980 285 p refs Workshop held at Palo Alto, Calif., 2-5 Dec. 1980

(NASA-TM-84147) Avail: NTIS HC A13/MF A01 CSCL 01A

Advanced rotorcraft technology and tilt rotor aircraft were discussed. Rotorcraft performance, acoustics, and vibrations were discussed, as was the use of composite materials in rotorcraft structures. Rotorcraft aerodynamics, specifically the aerodynamic phenomena of a rotating and the aerodynamics of fuselages, was discussed. R.J.F.

N82-19173*# National Aeronautics and Space Administration, Washington, D. C.
NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOPS. VOLUME 4: FLIGHT CONTROL AVIONICS SYSTEMS AND HUMAN FACTORS
5 Dec. 1980 149 p refs Workshop held at Palo Alto, Calif., 2-5 Dec. 1980
(NASA-TM-84148) Avail: NTIS HC A07/MF A01 CSCL 01A

Helicopter user needs, technology requirements and status, and proposed research and development action are summarized. It is divided into three sections: flight dynamics and control; all weather operations; and human factors. L.F.M.

N82-19181*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF INSTALLATION OF F101 DFE EXHAUST NOZZLES ON THE AFTERBODY-NOZZLE CHARACTERISTICS OF THE F-14 AIRPLANE
David E. Reubush and John R. Carlson Mar. 1982 133 p refs
(NASA-TM-83250; L-14895) Avail: NTIS HC A07/MF A01 CSCL 01A

A wind-tunnel investigation was conducted to determine the effects of F101 DFE (derivative fighter engine) nozzle axial positioning on the afterbody-nozzle longitudinal aerodynamic characteristics of the F-14 airplane. The model was tested in the Langley 16-Foot Transonic Tunnel at Mach numbers from 0.7 to 1.25 and angles of attack from about -2 to 6 degrees. Compressed air was used to simulate nozzle exhaust flow at jet total-pressure ratios from 1 (jet off) to about 8. The results of the investigation show that for subsonic Mach numbers the intermediate cruise nozzle position of the three positions tested resulted in the lowest drag. Author

N82-19184# Bristol Univ. (England). Dept. of Aeronautical Engineering.
THE EFFECT OF A WELL ON THE AERODYNAMICS OF A SPOILER B.S. Thesis
N. A. Camm and J. J. Ovens Jun. 1981 82 p refs Original contains color illustrations
(BU-268) Avail: NTIS HC A05/MF A01

As an aid to spoiler design, the aerodynamics of a spoiler and its well were investigated. Particular attention was paid to gap and deployment angle. Three different shapes of spoiler and three types of well were tested. All tests were two dimensional, the spoiler being attached to a flat plate at zero incidence. A well was cut into the plate such that the spoiler was flush when not deployed. The Reynolds number was 62,000, based on fence chord. Flow visualization techniques and static pressure measurements were used both along the flat plate and around the spoiler to determine and understand the pressure distribution. Integration of the pressure results shows the normal force distribution. The application of the results to spoiler design is discussed through examples. Author (ESA)

N82-19185 Department of Trade and Industry, London (England).
REPORT OF THE AIR TRAFFIC FORECASTING WORKING PARTY, 1981
Sep. 1981 30 p ref.
Copyright. Avail: Issuing Activity

The U.K. forecasting model (improved by including relative tourist prices as a variable in leisure traffic equations and by refining business traffic specifications) is used to predict air traffic demand in the 1990's. London airports are treated separately. The effects of oil price rises, a channel tunnel, and hotel constraints in London are discussed. An increase of between 28 and 70 million passengers is predicted, i.e., a 2.5% to 5% annual growth rate. Growth rates for domestic traffic are lower than those projected for international traffic so that domestic traffic, which was 26% of the total in 1979, falls by 1995 to 23% on the low scenario and 20% on the high scenario. Author (ESA)

N82-19186*# Little (Arthur D.), Inc., Cambridge, Mass.
AN ASSESSMENT OF THE CRASH FIRE HAZARD OF LIQUID HYDROGEN FUELED AIRCRAFT Final Report
Feb. 1982 132 p refs
(Contract NAS3-22480)
(NASA-CR-165525; ADL-85181) Avail: NTIS HC A07/MF A01 CSCL 01C

The crash fire hazards of liquid hydrogen fueled aircraft relative to those of mission equivalent aircraft fueled either with conventional fuel or with liquefied methane were evaluated. The aircraft evaluated were based on Lockheed Corporation designs for 400 passenger, Mach 0.85, 5500 n. mile aircraft. Four crash scenarios were considered ranging from a minor incident causing some loss of fuel system integrity to a catastrophic crash. Major tasks included a review of hazardous properties of the alternate fuels and of historic crash fire data; a comparative hazard evaluation for each of the three fuels under four crash scenarios a comprehensive review and analysis and an identification of areas further development work. The conclusion was that the crash fire hazards are not significantly different when compared in general for the three fuels, although some fuels showed minor advantages in one respect or another. R.J.F.

N82-19187# Federal Aviation Administration, Atlantic City, N.J.
ANALYSIS OF A NONLINEAR ALTITUDE TRACKING METHOD Final Report, Sep. - Dec. 1980
Barry R. Billmann Nov. 1981 57 p refs
(FAA Proj. 052-242-320)
(AD-A108878; FAA-CT-81-18; FAA-RD-81-69) Avail: NTIS HC A04/MF A01 CSCL 01/2

This report analyzes the performance of the nonlinear altitude tracker developed for the Active Beacon Collision Avoidance System (BCAS) by Lincoln Laboratory. The tracker is intended for use in the collision avoidance logic of the BCAS system. The nonlinear tracker performance was characterized through comparisons with the previous altitude tracker. The original tracker, used by the collision avoidance logic, was a simplistic alpha-beta tracker. The nonlinear tracker performance evaluation was conducted in three phases: (1) The stand-alone error characteristics of the tracker were obtained. Simulated mode C report sequences were provided directly to the tracker. (2) The nonlinear tracker was integrated directly into the collision avoidance logic. With the use of the Fast-Time Encounter Generator (FTEG), a comparative study of performance with the nonlinear tracker versus the alpha-beta tracker was made. (3) Selected live flight test encounters were used to analyze the relative performance of the alpha-beta tracker versus the nonlinear tracker. The stand-alone analysis revealed that the nonlinear tracker consistently had smaller maximal errors in vertical rate estimation and a smaller transient rate response delay than did the alpha-beta tracker. Both the live flight test encounter simulations and the FTEG scenario simulation indicated that nonlinear tracking often caused an increase in separation for encounters with vertically accelerating threats and reduced occurrences of incorrect command sense choice. Author (GRA)

N82-19188# Federal Aviation Administration, Washington, D.C. Office of Management Systems.
FAA STATISTICAL HANDBOOK OF AVIATION Annual Report, period ending 31 Dec. 1980
31 Dec. 1980 183 p
(AD-A108289) Avail: NTIS HC A09/MF A01 CSCL 01/2

This report presents statistical information pertaining to the Federal Aviation Administration, The National Airspace System, Airports, Airport Activity, U.S. Civil Air Carrier Fleet, U.S. Civil Air Carrier Operating Data, Airmen, General Aviation Aircraft, Aircraft Accidents, and a Glossary of the terms used in this publication. Author (GRA)

N82-19189# Aeronautical Research Labs., Melbourne (Australia).
DISENGAGEMENT OF SAFETY HARNESS BUCKLES - CT4 Report, Aug. - Dec. 1979
S. R. Sarrailhe and G. A. Thomas Mar. 1981 25 p
(AD-A108048; ARL/STRUC-NOTE-466) Avail: NTIS HC A02/MF A01 CSCL 13/12

During the crash of a CT4 Airtrainer in August, 1979 both safety harness buckles disengaged. The crash was very severe but the harnesses did not show signs of overloading. After a series of tests it was concluded that the buckles disengaged because of misalignment of the loads onto the buckle. The misalignment may not be represented in the standard test procedures and they may give a false sense of security. The control angles. For comparisons mathematical models like the local momentum theory, and a fixed vortex model were applied. For these experiments a four bladed hingeless rotor and a two bladed See Saw rotor with an advance ratio of up to mu = 0.2 were used. Numerous tests were performed to study the flow field of rotor downwash in different wind tunnels. The measuring equipment for the downwash was set up on both sides of the rotor stand. So it was possible to receive two values at the same time. At first pneumatic probes were applied, that gave acceptable mean values, and then hot-wire probes in X-configuration were used to investigate downwash dynamics in more detail. Measurements were conducted in the x-z-plane. Wind tunnel test results, correlation to the mathematical models, and errors are discussed. J.M.S.

N82-18159*# Ohio State Univ., Columbus. Dept. of Mechanical Engineering.

HOVER TESTS OF A MODEL H-FORCE ROTOR

H. R. Velkoff *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs

(Contract NCA2-OR565-001)

Avail: NTIS HC A99/MF A01

The potential of using tip vanes at the ends of helicopter rotor blades to obtain a controllable H-force is considered. The addition of vanes placed perpendicular to the blade tips can be used to obtain an inplane force. By varying the angle of the vanes, a radial force can be created which can be controllable in azimuth position. Such a force could be used to provide translational motion of the rotor and aircraft without the requirement for rotor tilting. In addition, an H-force generated at high flight speed could be used as a propulsive force in a matter similar to a propeller. The force generated by the vanes could also affect the aircraft's stability characteristics. The H-force could also modify rotor performance in hovering since they could be thought to act as a virtual shroud. Tests were run with a model rotor which has a 6 foot diameter with a 3 inch chord blade. Test data are presented on the effects of various tip-vane configurations on the hovering figure of merit. The extreme sensitivity of the performance to vane arrangement is shown. Author

N82-18160# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

THE PROBLEM OF CALCULATION OF THE FLOW AROUND HELICOPTER ROTOR BLADE TIPS

H. Stahl *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 18 p refs

Avail: NTIS HC A99/MF A01

There are special problems with the theoretical analysis of the flow around helicopter rotor blade tips that are based on the fact that the flow is three dimensional, unsteady, rotational, and on the advancing blade in fast forward flight also transonic. Theories for this problem based upon potential flow theory are presented. Calculations show that this approach can lead to a sufficient discription of the actual flow. Computer programs for the three dimensional steady and the unsteady two dimensional flow past fixed wings were modified for rotating rotor blades. Results are shown. T.M.

N82-18161# Office National d'Etudes et de Recherches Aeronautiques, Paris (France).

APPLICATION OF THE ONER DYNAMIC STALL MODEL TO A HELICOPTER BLADE IN FORWARD FLIGHT

C. T. Tran and D. Falchero (SNIAS, Marignane, France) *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 26 p refs

Avail: NTIS HC A99/MF A01

The model was applied to the case of a helicopter rotor system in forward flight. Aspects of stability and periodic response are described and include: the form of the Floquet modes-subharmonic oscillation and almost periodic oscillation; the evolution of these modes as functions of the rotor advance ratio; the periodic response and aerodynamic force and moment; and a comparison with a quasi-steady aeroelastic calculation showing the effects of unsteady phenomena. T.M.

N82-18162# Royal Aircraft Establishment, Farnborough (England).

SOME UNSTEADY AERODYNAMIC EFFECTS ON HELICOPTER ROTORS

P. G. Wilby, M. J. Riley, and Judith Miller *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 14 p refs

Avail: NTIS HC A99/MF A01

Unsteady effects have an important influence on the aerodynamic loading experienced by a helicopter rotor in forward flight. These effects include dynamic stall characteristics with the associated stall delay and large nose-down change in pitching-moment. All unsteady effects must be taken into account when predicting rotor loads, performance and flight envelope. However, the full unsteady effects on the rotor result from simultaneous oscillatory variations of both incidence and Mach number, and it is difficult to study these effects in isolation from the rest of the rotor environment. Empirical methods for modelling these effects, especially dynamic stall characteristics, were developed and incorporated in the rotor loads prediction methods. Results from a program of work involving oscillatory aerofoil tests, flight experiments and unsteady aerodynamic prediction methods are presented. T.M.

N82-18163# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

SEPARATED FLOW AROUND HELICOPTER BODIES

G. Polz and J. Quentin *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs

Avail: NTIS HC A99/MF A01

On the rear part of the helicopter fuselage, flow separation is often unavoidable owing to the shape of the afterbody which is often defined more in accordance with operational requirements (for example cargo door) and with only minor consideration to aerodynamic aspects. Because of the separated flow, an analytical calculation of the flow field using potential flow theory is not possible. After an overview about the separated flow phenomena a method is explained based on a combination of panel methods with boundary layer analysis. In this method the wake flow region is represented by a wake body which consists of a uniformly distributed vorticity. Calculated pressure distributions and flow fields are shown in comparison with wind tunnel test results. The main interest lies in the more downstream part of the wake, which is very important for the tail surface and tail rotor effectiveness. Author

N82-18164# Southampton Univ. (England). Dept. of Aeronautics and Astronautics.

A METHOD OF PREDICTING FUSELAGE LOADS IN HOVER

P. Taylor *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 13 p refs

Avail: NTIS HC A99/MF A01

A computer program called DOWNLOAD was developed in which the fuselage separated flow is modelled using a vortex sheet representation. The vortex sheet model can predict the separated flow pressure distribution provided the separation point is known. Unfortunately, the poor behavior of the vorticity vector in the separation region prevents an accurate prediction of the separation line. DOWNLOAD was applied to three simple fuselage shapes with a simple triangular representation of the rotor downwash. The predicted download values were in the lower region of the figures usually quoted as a percentage of thrust. T.M.

N82-18165# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

IMPACT OF SYSTEMS TECHNOLOGY AND INTEGRATION ON HELICOPTER DESIGN

K. Schymanietz *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 20 p refs

Avail: NTIS HC A99/MF A01

A helicopter design depends on a variety of parameters, criteria and requirements. A new design is generated either by a direct order of a customer or due to industrial investigations in the different fields like market trend studies, application of advanced or new technologies and/or overall efficiency improvements. A complete design includes not only the vehicle design with its main functional groups but also the integration of the systems/equipment concept. In the past a new helicopter design was conducted mainly due to the task for a new vehicle. The fact that - especially in the military field - the impact of systems gets an increasing influence in all design areas, gives an impression of the importance of systems technology and integration in the helicopter design. Future changes in design concepts are considered in terms of the chronological advance in the design of the different system components, new technologies for new systems, e.g., in the field of visionics, and system architecture based on a digital bus connection. T.M.

N82-18166# Army Aviation Research and Development Command, St. Louis, Mo.

REVIEW OF HELICOPTER MAST MOUNTED SIGHT (MMS) BASE MOTION ISOLATION AND LINE-OF-SIGHT (LOS) STABILIZATION CONCEPTS

Daniel P. Schrage *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 16 p refs

Avail: NTIS HC A99/MF A01

Incorporation of a MMS or any precision stabilized pointing system on a helicoper is a complex and interesting dynamic design problem which combines automatic control through a servomechanism with vibration reduction techniques. Generally, the helicopter disturbance inputs to the MMS must be accomodated by a stiffer MMS structure and servo-system. However, weight and cost are usually critical and many benefits could be derived from incorporation of a lightweight vibration isolator. There are important design considerations on both sides of the interface, the airframe and the MMS. A review of these design considerations and several vibration isolation concepts is presented. The need for adequate simulation modeling of this complex dynamic environment is discussed. T.M.

N82-18167# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).

MAST MOUNTED VISUAL AIDS

R. D. vonReth *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 24 p refs

Avail: NTIS HC A99/MF A01

Initial flight tests with a spherical mock up, having the same shape, weight and moments of inertia as the actual system were carried out on a Bo 105 with two different rotormast extensions (90 and 120 cm). A vibration survey over most of the Bo 105's flight envelope showed vibrational loads which can be tolerated by the actual system. As a next step the actual stabilized platform with FLIR, TV-camera and laser range finder was installed on the rotormast. In addition several subsystems used for the display of the video images with superimposed symbology are described. For direct comparison purposes three different systems, head up, head down and helmet mounted sight and display were evaluated. The influence of the rotorplane, vibrational loads and meteorological conditions on the performance of the FLIR image is described. T.M.

N82-18168# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugfuehrung.

EXPERIMENTAL INVESTIGATION OF VISUAL AIDS FOR HELICOPTERS: LOW LEVEL FLIGHT AT NIGHT AND POOR VISIBILITY

R. Beyer, E. Dannebarg, E. Kohnen, and H. Stein *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 15 p refs

Avail: NTIS HC A99/MF A01

The potential and the limitations of advanced display systems for visual aids in helicopters were investigated. A combination of the sensor image and computer generated instrument displays in a head-down display, helmet mounted sight/display and night goggles, were evaluated. The layout of the instrument display is considered assuming transport mission and various display modes are implemented. The visual aids were flight tested in Bo 105 and Bell UH-1D helicopters with particular emphasis on the usefulness of the display modes on flight performance and low level flight performance. T.M.

N82-18169# Litton Systems (Canada) Ltd., Toronto (Ontario). Advance Programs.

THE MULTI MODE MATRIX FLAT PANEL DISPLAY: TECHNOLOGY AND APPLICATIONS

A. Moffat and P. Wright *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 19 p refs

Avail: NTIS HC A99/MF A01

An important aspect of current developments in advanced cockpit design is the introduction of a small number of interactive multi-function electronic displays with digital data processing, in conjunction with a MIL-STD-1553 type of multiplex data bus in an integrated system as opposed to the conventional approach of large numbers of stand-alone electro-mechanical instruments and a variety of different and independent dedicated inputs. Advances in high speed vector graphic display systems based on modular LED flat panel technology and micro-programmable multiprocessor data handling with MIL-STD-1553B compatible interfaces are described. Applications and systems performance are discussed in terms of typical military airborne mission-oriented display image formats and associated hardware and software characteristics. The real-time vector graphic presentations as described include flight control, navigation, communications, engine and fuel management, weapons management, symbolic map, signal communication and other types of real-time cockpit advisory information. T.M.

N82-18170# Bodenseewerk Geraetetechnik G.m.b.H., Ueberlingen (West Germany).

A REDUNDANCY CONCEPT FOR A DIGITAL CSAS

P. Wuest and M. Keller *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 12 p refs

Avail: NTIS HC A99/MF A01

One of the promises of digital technology is the possibility of implementing more intelligent monitoring techniques, for example, self monitoring methods. Typical redundancy and monitoring concepts, which were realized in aircraft, helicopter and engine control systems were reviewed. A system which was orginally not designed for a helicopter application but which shows all characteristics of a CSAS is described. The system is based on two essentially autonomous computing lanes, each able to provide all the necessary control and monitoring functions. T.M.

N82-18171# Newmark (Louis) Ltd., Croydon (England).

THE INFLUENCE OF SENSOR AND ACTUATOR CHARACTERISTICS ON OVERALL HELICOPTER AFCS DESIGN

S. G. Spreadborough *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p

Avail: NTIS HC A99/MF A01

The overall performance of a flight control system is dependent on the characteristics of: sensors-type and performance; control low computing and logic; actuation-performance, configuration redundancy and authority. The specifications in each of these areas are considered in producing an integrated AFCS design which is compatible with the basic aircraft characteristics. The choice of sensors and the configuration and performance of the actuation, important decisions involving a high level of interdependence with the control law and system logic design, are discussed. T.M.

N82-18172# Institut fuer Flugmechanik, Brunswick (West Germany).

EVALUATION OF THE HELICOPTER LOW AIRSPEED SYSTEM LASSIE

J. Kaletka *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 23 p refs

Avail: NTIS HC A99/MF A01

To evaluate the airspeed sensing capability and the dynamic response characteristics of the system, both flight tests and wind tunnel tests were conducted. The system uses a swivelling pitot static probe designed to operate within rotor downwash in the low airspeed regime and out of downwash for higher speeds. Due to nonlinearities in the sensor transition phase an accurate system characterization is necessary to obtain reliable airspeed data. Flight tests that were conducted to characterize the system for a Bo 105 helicopter are described. The evaluation method and results, showing uncalibrated and calibrated data are discussed in detail. To investigate the dynamic behaviour of the system, dynamic tests in a wind tunnel equipped with a gust generating system were conducted. LASSIE transfer functions were measured for four different wind tunnel speeds. Representative results are shown and discussed. T.M.

N82-18173# Elektronik-System G.m.b.H., Munich (West Germany).

INTEGRATION OF INERTIAL SENSORS IN HELICOPTERS

tests are proposed, but further work would be desirable to establish design and test criteria. Author (GRA)

N82-19200 Virginia Univ., Charlottesville.
OPTIMAL AIRCRAFT LANDING PATTERNS FOR MINIMAL NOISE IMPACT Ph.D. Thesis
Robert Chi-Tuan Chang 1981 183 p
Avail: Univ. Microfilms Order No. 8129300

A total system to perform the task of optimizing aircraft landing trajectories with respect to aircraft noise annoyance in the area near airports was developed. The noise annoyance considered was solely due to aircraft. Multiple aircraft on multiple landing paths were studied by the total system developed. While many of the subsystems such as the aircraft noise signature model, annoyance model, optimization methods, etc. already existed, the task was to combine all these together into a single working system. The various subsystems included an annoyance model (aircraft noise signature model, population model, impact intensity weighting function), formulation of aircraft landing paths and constraints, performance measure, and optimization. A single numerical number, noise impact index, which represents the average severity of noise impact over the entire population of a community was adopted as the annoyance index. Dissert. Abstr.

N82-19201# Committee on Science and Technology (U. S. House).
AIRCRAFT COLLISION AVOIDANCE SYSTEMS
Washington GPO 1981 443 p refs Hearings before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 97th Congr. 1st Sess., No. 5, 31 Mar. and 3 Apr. 1981
(GPO-79-431) Avail: Subcommittee on Transportation, Aviation and Materials

Midair collision avoidance systems, especially the beacon collision avoidance system is discussed. Magazine articles, letters, and statements of government and industry personnel are included. R.J.F.

N82-19202# Committee on Science and Technology (U. S. House).
AIR TRAFFIC CONTROL EN ROUTE COMPUTER SYSTEM
Washington GPO 1981 10 p Rept. to accompany H.R. 202 presented by the Comm. on Sci. and Technol., 97th Congr., 1st Sess., 14 Oct. 1981
(GPO-89-006; H-Rept-97-271) Avail: US Capitol, House Document Room

Amendments to the House Resolution requiring the Administrator of the FAA to submit full research and development program planning documentation to the Committee with respect to the modernization and replacement of the en route computer system are presented. Background material included covers the current ATC system as well as the justification, benefits, costs, and acquisition strategy for replacing the computer. It is recommended the FAA establish a mechanism whereby the judgements and experience of operating personnel and users of the air system be included in the en route computer development process. A.R.H.

N82-19203# Mitre Corp. McLean, Va.
ACTIVE BEACON COLLISION AVOIDANCE SYSTEM (BCAS) LOGIC PERFORMANCE DURING OPERATIONAL FLIGHT TESTS Report, 13 Jul. - 9 Sep. 1980
R. A. Tornese and A. L. McFarland Washington FAA Jan. 1981 123 p refs
(Contract DTFA01-81-C-10001)
(AD-A108893; MTR-80/W352; FAA-RD-80-138) Avail: NTIS HC A06/MF A01 CSCL 17/7

Between 13 July and 9 September 1980, operational flight tests of an Active BCAS Experimental Unit (BEU) were conducted. The flight tests included 129 approaches to 28 different airports during 60 hours of flight: 14 unplanned encounters which gave rise to BCAS alerts were recorded. In each of the encounters, the aircraft carrying the BEU came into a conflict with another aircraft entirely by chance. The other aircraft was not associated with the BCAS test program in any way. The primary purpose of the flight tests was to determine how many unplanned alerts would occur during normal flight operations and to assess whether each was a desirable or unwanted alert. In addition, alert correctness, timeliness, and utility were considered along with the potential impact of BCAS on the ATC system. The data was also used to determine approximately the region(s) where desensitization of BCAS threat logic should be applied to limit unwanted alerts. GRA

N82-19205*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
VEHICLE TEST REPORT: BATTRONIC PICKUP TRUCK
Theodore W. Price, Thomas W. Shain, Raymond J. Freeman, and Michael F. Pompa 1 Jan. 1982 47 p refs
(Contracts NAS7-100; DE-AI01-78CS-54209)
(NASA-CR-168637; JPL-Pub-82-8; DOE/CS-54209/6) Avail: NTIS HC A03/MF A01 CSCL 13F

An electric pickup truck was tested to characterize certain parameters and to provide baseline data that can be used for the comparison of improved batteries that may be incorporated into the vehicle at a later time. The vehicle tests were concentrated on the electrical drive subsystem; i.e., the batteries, controller, and motor. The tests included coastdowns to characterize the road load and range evaluations for both cyclic and constant speed conditions. A qualitative evaluation of the vehicle's performance was made by comparing its constant speed range performance with other vehicles. S.L.

N82-19206# Canyon Research Group, Inc., Westlake Village, Calif.
DESCENT-RATE CUING FOR CARRIER LANDINGS: EFFECTS OF DISPLAY GAIN, DISPLAY NOISE AND AIRCRAFT TYPE Interim Report, 1 May 1980 - 30 Nov. 1981
Gaven Lintern, Daniel J. Sheppard, and Charles E. Kaul Oct. 1981 42 p refs
(Contract N61339-78-C-0060)
(AD-A108801; TR-81-015; NAVTRAEQUIPCEN-78-C-0060-8) Avail: NTIS HC A03/MF A01 CSCL 01/2

Two studies are reported concerning the utility of modifying a conventional Fresnel Lens Optical Landing System (FLOLS) to include variable-length vertical light arrays, or arrows, in order to provide descent-rate information to pilots making carrier landings. In the first study, the Descent-Rate Cuing (DRC) algorithm incorporated an angular gain to provide glideslope displacement information. The DRC system did not significantly improve glideslope tracking performance. Lineup performance was not adversely affected. The effects of aircraft type and noise on the DRC were also examined. In the second study, the DRC algorithm incorporated a modified linear gain to provide glideslope displacement information. The DRC system consistently reduced glideslope error throughout the approach. Comparison of the data and previous research suggests that a DRC system incorporating a linear gain can produce a strong and consistent improvement in glideslope control in carrier landings. Author (GRA)

N82-19207# Federal Aviation Administration, Atlantic City, N.J.
TRANSPORT AIRCRAFT COCKPIT STANDARDIZATION (FEDERAL AVIATION REGULATIONS PART 25) Final Report
Richard Sulzer Nov. 1981 42 p
(FAA Proj. 161-200-130)
(AD-A108924; FAA-CT-80-54; FAA-EM-81-11) Avail: NTIS HC A03/MF A01 CSCL 01/3

The present status of transport aircraft cockpit standardization was evaluated by examination of regulations and other design practice documents and by interviews with airline pilots and engineers. Flight critical areas most in need of increased standardization were identified as (1) primary flight guidance instrumentation and (2) pilot input keyboards. Additional areas proposed for further industry consultation, possibly leading to further standardization at a future date, include flap, slat, and leading-edge device control and display systems; indicated airspeed (IAS)-Mach indicators; powerplant instrumentation; and electric and hydraulic power diagrams, displays, and controls. The continued use of a mixed metric and English unit measurement plan in both United States and foreign manufactured aircraft is noted, and the incidence of pilot dual qualifications and the need for criteria for digital system software certification are also discussed. GRA

N82-19208# Army Aviation Engineering Flight Activity, Edwards AFB, Calif. Directorate of Development and Qualification.
HELICOPTER ICING SPRAY SYSTEM (HISS) NOZZLE IMPROVEMENT EVALUATION Final Report
Daumants Belte Sep. 1981 53 p refs
(AD-A108405; USAAEFA-79-02-2) Avail: NTIS HC A04/MF A01 CSCL 01/2

The U.S. Army Aviation Engineering Flight Activity (USAAEFA) operates a modified CH-47C helicopter as an airborne spray tanker to create a simulated icing test environment. This system was modified to improve its spray cloud characteristics with respect to uniformity of liquid water content (LWC) and reduction of drop size median volumetric diameter (MVD). The existing atomizers on the spray boom assembly were replaced by Sonic Development Corporation model 125-H 'Sonicore' nozzles. A UH-1H helicopter equipped with particle measuring spectrometers conducted in-flight sampling and calibration of a modified HISS spray cloud in conjunction with other helicopter icing tests. Average cross sectional dimensions of the present spray cloud was estimated as 36 ft wide and 8 ft deep. Usable values of cloud LWC in excess of 1 gram per cubic meter with a drop size MVD range of 20 to 35 microns can be generated at a 90 knot airspeed. GRA

N82-18209# Kaman Aerospace Corp., Bloomfield, Conn.
DEVELOPMENT OF MANUFACTURING TECHNOLOGY FOR FABRICATION OF A COMPOSITE HELICOPTER MAIN ROTOR SPAR BY TUBULAR BRAIDING Final Report, Sep. 1978 - Sep. 1980
Mark L. White St. Louis, Mo. Army Aviation Research and Development Command Apr. 1981 81 p refs
(Contract DAAG46-78-C-0070)
(AD-A109377; R-1618; AVRADCOM-TR-81-F-8) Avail: NTIS HC A05/MF A01 CSCL 11/4

Mechanical tubular braiding has been shown to be a viable blade spar manufacturing process in a program which included preliminary design of an improved main rotor blade for the OH-58 helicopter. The blade incorporates an advanced aerodynamic shape and has as its primary structural member a Kevlar 49/epoxy spar fabricated by braiding. Achievement of an analytically acceptable blade and spar design meeting critical structural and dynamic requirements was not hindered by braiding process constraints. Mechanical property tests of flat panels and spar sections exhibited excellent correlation with analytical predictions, substantiating the applicability of normal composite laminate analysis methods and the validity of the specific design. Ballistic testing of spar sections demonstrated superior containment of structural damage compared to composite spars produced by more conventional methods. Manufacturing cost estimates predict a price reduction of 1/3 for the braided spar relative to a similar S-glass/epoxy spar for an OH-58 blade of identical external shape fabricated by orthodox, low-cost technology. Author (GRA)

N82-18210# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.
EXPERIENCE DURING THE DEVELOPMENT OF THE GERMAN-JAPANESE HELICOPTER BK 117 [ERFAHRUNGEN WAEHREND DER ENTWICKLUNG DES DEUTSCH-JAPANISCHEN HUBSCHRAUBERS BK 117]
Klaus Szczepanik and Hans Fabian 1981 17 p In GERMAN Presented at DGLR Jahrestagung, Brunswick, 1980
(MBB-UD-318-81-O) Avail: NTIS HC A02/MF A01

The German-Japanese collaboration in building the BK 117 helicopter is described. The exchange of know-how, information dissemination, telecommunication, and technical expertise, are enumerated. It is shown that since international cooperation is possible, the German industries should be able to exchange and cooperate in the development of new products. Transl. by E.A.K.

N82-18211# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.
PERSPECTIVES FOR CONTROLLED WEAPONS TECHNOLOGY: REPORT OF THE 90TH HELICOPTER FORUM [PERSPEKTIVEN DER LENKWAFFENTECHNIK FUER DIE 90ER JAHRE VORTRAGE VOR DEM HUBSCHRAUBER FORUM BUECKEBURG]
D. Weis 2 May 1980 13 p In GERMAN Forum held in Bueckeburg, West Germany, 5-7 May, 1980
(MBB-UA-532-80-O) Avail: NTIS HC A02/MF A01

A general forecasting for the essential guided missile systems technology in the 1990s is presented. The development of armored guided missiles since its conception in 1958, and an outline of goals and trends of armored defense for the near and far future are presented. Possibilities of acceleration in mission accomplishments of future armored defensive weapon systems are examined. Transl. by E.A.S.

N82-18212# National Aerospace Lab., Amsterdam (Netherlands). Space Div.
A METHOD FOR APPLYING LINEAR OPTIMAL CONTROL THEORY TO THE DESIGN OF A REGULATOR FOR A FLEXIBLE AIRCRAFT
L. J. J. Erkelens and J. L. [illegible] 31 Mar. 1980 69 p refs Previously announced as NLR-TR-79119-C Sponsored by Directorate of Materiel Air RNLAF
(NLR-TR-80032-U; NLR-TR-79119-C) Avail: NTIS HC A05/MF A01

A hypothetical control system that provides improved rigid body and structural mode damping of a flexible aircraft in order to improve the riding quality and minimize the wing bending moment during flight in turbulence is considered. The equations of motion are related to a high performance fighter aircraft with external stores. The feedback gains are determined, using linear optimal control theory. A quadratic optimization criterion, taking into account the normal acceleration at the pilot seat and the wing root bending moment, is used. A number of optimal and suboptimal regulators are calculated. The system performance is expressed in terms of pole location, frequency response, and power spectra for both pilot seat acceleration and wing root bending moment. Aircraft response to a deterministic gust disturbance is presented. Author (ESA)

N82-18213# Technische Hogeschool, Delft (Netherlands). Dept. of Aerospace Engineering.
ON THE DESIGN OF SOME AIRFOILS FOR SAILPLANE APPLICATION
L. M. M. Boermans and H. J. W. Selen Apr. 1981 47 p refs Presented at 17th OSTIV Congr., Paderborn, West Germany, 1981
(VTH-LR-326) Avail: NTIS HC A03/MF A01

Airfoils were designed such that, by adding material to the surface, an existing wing could be modified and tested in flight. Wind tunnel experiments on inner and outer wing segments are described, giving information on the quality of actual airfoils achieved in serial production and of the LSL airfoil analysis and design computer program. The characteristics of several modern airfoils used in standard class sailplanes are analyzed and typical differences in the case of smooth surface and of rough leading edge are clarified. Wind tunnel measurements with real insect remains on a wing segment are compared with a well known simulated bug pattern and shown to have greatly different drag characteristics. The application of pneumatic turbulators to reduce the drag of an airfoil is discussed. The computer program was used to modify the wing of an ASW-19B sailplane. Flight tests are satisfactory. Author (ESA)

N82-18214# Bristol Univ. (England). Dept. of Aeronautical Engineering.
A FURTHER STUDY OF HELICOPTER ROTOR PITCH-FLAP-PHASE COUPLING B.S. Thesis
A. East and N. S. Sahni Jun. 1981 81 p refs
(BU-258) Avail: NTIS HC A05/MF A01

Pitch-flap phase coupling between the blades of a helicopter rotor was studied in order to improve overall aircraft stability. A mathematical model was constructed for the Westland Lynx helicopter, which incorporates a semiarticulated rotor head. Full expressions are derived in a lengthy, but accurate fashion for the blade flapping motion as well as for rotor hub forces and moments. The rotor state defined is believed to be more accurate than that of any previous, known treatment. Pitch-flap phase coupling of the form: blade pitch angle at rotor center line = blade pitch control angle + pitch-flap coupling gain (blade flap angle + pitch-flap-phase coupling lead/lag), is introduced. The effect on the rotor derivatives is given with change in phase lead/lag angle and control gain. A full six degrees of freedom model is extensively used for the study of stability, with the results beset with problems which are discussed. Author (ESA)

N82-18215# Bristol Univ. (England). Dept. of Aeronautical Engineering.
A DESIGN STUDY OF THE MARSHAL B.S. Thesis
D. Sum and G. H. Tan Jun. 1981 55 p refs
(BU-262) Avail: NTIS HC A04/MF A01

The feasibility of a six seat variant of the [illegible] twin-engined aircraft, the Marshal, was studied. Results show that the Marshal, powered by two 200 h.p. engines and of an all-up-weight (AUW) of 3550 lb, can compete in the open market both in terms of performance and price. No major structural alterations, except on the fuselage to accommodate two additional passengers, are envisaged. This aircraft is expected to be suitable

Volkmar Held *In* DGLR Seventh European Rotorcraft and Powered Lift Aircraft Forum 1981 17 p
Avail: NTIS HC A99/MF AU1

The demand for saving weight, volume and especially cost requires new design concepts for avionic systems. In future, highly integrated systems will replace the conventional systems with specific stand-alone equipment for each system function. A concept for the integration of inertial function flight control, sight-stabilization, navigation of a helicopter is presented. A configuration with a minimum number of dislocated inertial sensors is proposed. The system functions are accomplished on system level by integration and multiple use of the sensor signals. It is shown that the navigation functions, attitude and heading can be derived from the flight control and stabilization hardware so that the usually required separate attitude and heading reference system for the navigation is saved. Moreover, the proposed concept provides as an additional function the autonomous initial alignment to north. T.M.

N82-18179*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN ANALYTICAL INVESTIGATION OF THE FREE-TIP ROTOR FOR HELICOPTERS
Robert H. Stroub Feb. 1982 30 p refs
(NASA-TM-81345; A-8806) Avail: NTIS HC A03/MF A01 CSCL 01A

A rotor configuration called the free-tip rotor was analytically investigated for its potential to improve helicopter forward-flight performance characteristics. This rotor differs from a conventional rotor only in the blade tip region. In this configuration, the tip is self-adjusting in pitch with respect to the rest of the blade, in accordance with a moment balance about its pitch axis. With this self-adjusting capability, the resulting pitch motion generates a more uniform airload distribution around the azimuth. Computer math models were used to compare performance characteristics of the free tip rotor with those of a conventional rotor operation at flight speeds from 130 to 160 knots. The results of this analysis indicate that the free-tip rotor improves cruise lift-drag ratio by at least 22%. Author

N82-18183*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPIN-TUNNEL INVESTIGATION OF A 1/13-SCALE MODEL OF THE NASA AD-1 OBLIQUE-WING RESEARCH AIRCRAFT
William L. White and James S. Bowman, Jr. Feb. 1982 28 p ref
(NASA-TM-83236; L-14834) Avail: NTIS HC A03/MF A01 CSCL 01A

The spin and recovery characteristics of a 1/13-scale model of the NASA AD-1 oblique-wing research aircraft at wing-skew positions of 0, 25, 45, and 60 deg (right wing forward) were investigated. Spins were obtained for all wing-skew positions tested. For the unskewed wing position, two spin modes were possible. One spin mode was very steep and recoveries were obtained within 1 turn or less by rudder reversal. The second spin mode was flat and fast; the angle of attack was about 75 deg and the spin rate was about 145 deg/sec (2.5 seconds per turn). For the skewed wing positions, spins were obtained only in the direction of the forward-skewed wing (right wing forward). No spins were obtained to the left when the wing was skewed with the right wing forward. Recoveries should be attempted by deflecting the rudder to full against the spin, the ailerons to full with the spin, and movement of the wings to 0 deg skew. If the wing is skewed, the recovery may not be effected until the wing skew approaches 0 deg. B.W.

N82-18187# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.
ON THE CALCULATION OF TRANSONIC BLADE TIP FLOW FOR HELICOPTER ROTORS [ZUR BERECHNUNG DER TRANSSONISCHEN BLATTSPITZENUMSTROEMUNG BEI HUBSCHRAUBERROTOREN]
H. Stahl and V. Mikulla 8 May 1981 27 p refs In GERMAN Presented at DGLR Jahrestagung 1981, Aachen, 12-14 May 1981
(MBB-UD-320-81-O; DGLR-81-025) Avail: NTIS HC A03/MF A01

Blade element theory (two dimensional) based on the rotor calculation program, its radials and its chronological relationship was demonstrated. Blade tip flow is three dimensional and interstationary and the forward moving blade in a fast forward flight becomes transonic. Theories, based on potential theory are proposed, though these do not perform on rotary wings. This method demonstrates the real flow rate. A three dimensional calculation of the aerodynamic characteristics of the fixed wings, was utilized, to show that by introducing a Mach number per gradient along the rotor radius, rotor calculation can be modified. Transl. by E.A.K.

N82-18188# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).
ON THE CALCULATION OF SEPARATED FLOW ON HELICOPTER FUSELAGES [ZUR BERECHUNG DER ABGELOESTEN STROENUNG AN HUBSCHRAUBERRUEMPFEN]
G. Polz 11 May 1981 28 p refs In GERMAN Presented at DGLR Jahrestagung 1981, Aachen, 12-14 May 1981
(MBB-UD-321-81-O; DGLR-81-026) Avail: NTIS HC A03/MF A01

Separated flows in helicopters with dead water formation on the fuselage tail were examined. A model was developed which is based on a combination of panel and interface calculation method, which is simulated in the dead water area by a similar circulation coated track alignment body. The point of gravity lies more on the fuselage, which is especially significant for helicopter, because of its effect on tail rotor and tail plane. Results from wind tunnel tests and flight tests are presented.
Transl. by E.A.K.

N82-18189# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
INVESTIGATIONS OF THE SEPARATION BEHAVIOR ON AIRFOILS AT HIGH ANGLES OF ATTACK, USING LINEAR LIFT THEORY Thesis - Hochschule der Bundeswehr, Munich [UNTERSUCHUNGEN ZUM ABREISSVERHALTEN VON TRAGFLUEGELN IM HOHEN ANSTELLWINKELBEREICH MIT HILFE DER TRAGLINIENTHEORIE]
Karl-Heinz Haerdtl 1 Nov. 1980 157 p refs In GERMAN
(MBB-FE-122/S/PUB/37; Rept-80/7) Avail: NTIS HC A08/MF A01

Different methods for calculating the lift coefficient of an airfoil wing were examined. The calculation of aerodynamic characteristics of airplanes is of great importance. Complex three dimensional boundary layers, especially for swept back wings with leading edge slats and trailing edges with split flaps which very much effect airfoil flows. Two different methods to calculate three dimensional boundary layers are presented.
Transl. by E.A.K.

N82-18190# European Space Agency, Paris (France).
LAMINAR AIRFOILS FOR TRANSPORT AIRCRAFT
Armin Quast Oct. 1981 33 p refs Transl. into ENGLISH of "Laminarprofile fuer verkehrsflugzeuge" Rept. DFVLR-Mitt-80-07 DFVLR, Brunswick, Mar. 1980 33 p
(ESA-TT-680; DFVLR-Mitt-80-07) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 8,30

The development of laminar airfoils in order to save fuel by reducing drag is discussed. Laminarization through shaping is considered. Laminar and turbulent boundary layer theory and subjective assessment indicate that laminar airfoils for high Reynolds numbers are feasible, with a 22% fuel saving. The reduced cruising speeds, required, however, decrease passenger comfort, making them more suitable for freight carrying.
Author (ESA)

N82-18192# Rockwell International Corp., El Segundo, Calif.
MULTIPLE EJECTION EFFECTS ANALYSIS Final Report, 8 May - 30 Dec. 1980
G. A. Freeman and G. R. Casteel Wright-Patterson AFB, Ohio Air Force Medical Research Labs. Aug. 1981 92 p refs
(Contract F33615-80-C-0519; AF Proj. 7231)
(AD-A108277; NA-80-545; AFAMRL-TR-80-140) Avail: NTIS HC A05/MF A01 CSCL 06/5

Wind tunnel data for the ACES-B1 ejection seat in the presence of the B-1 forebody are documented and analyzed. Significant aerodynamic interactions exist at high speed between dual seats and between seat/forebody. Trajectory data are presented with and without the forebody effect upon the seat. The forebody flow field is shown to increase the human engineering/biomechanical problems during high-speed ejection.
Author (GRA)

N82-18193# Douglas Aircraft Co., Inc., Long Beach, Calif.

AIRCREW RESTRAINT AND MOBILITY TEST FIXTURE Final Report
A. Blair McDonald Wright-Patterson AFB, Ohio AMRL Jul. 1981 33 p refs
(Contract F33615-79-C-0522; AF Proj. 7231)
(AD-A108274; AFAMRL-TR-81-27) Avail: NTIS HC A03/MF A01 CSCL 14/2

The next generation combat aircraft with advanced aerodynamic and control features will have combat maneuver capability which will impose multiaxial accelerations on the aircrew. Advanced aircrew systems will be required for restraint, support, and mobility during these combat conditions. New concepts for these systems have been defined, but tests under representative dynamic conditions are necessary to evaluate the effectiveness of these concepts when implemented. Author (GRA)

N82-18194# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
PHYSIOLOGICAL ACCEPTABILITY TESTS OF THE SJU-5/A EJECTION SEAT: SECOND PHYSIOLOGICAL ACCEPTANCE DEMONSTRATION Final Report
William G. Ward, Jr. and Kenneth L. Miller 1 Jul. 1981 23 p refs
(AD-A108688; NADC-81215-60) Avail: NTIS HC A02/MF A01 CSCL 01/3

This program was conducted to evaluate solutions to deficiencies of the F18 Aircraft Martin-Baker SJU-5/A escape system which had been identified during the initial Physiological Acceptability Demonstration (Report No. NADC-79040-60). The proposed solutions evaluated during this program included: incorporation of 'toe guides' on the rudder pedals, relocation of the head rest, modification of the back support, and incorporation of leg garters into the anti-'G' suit. Of these, the head rest and back support still require additional modification. Upon satisfactory correction of the head rest and back support deficiencies, physiological acceptance of the F18 escape system will be recommended for the pilot's station. Author (GRA)

N82-18195# RAND Corp., Santa Monica, Calif.
DISTRIBUTED INTELLIGENCE FOR AIR FLEET CONTROL Interim Report
Randall Steeb, Stephanie Cammarata, Frederick A. Hayes-Roth, Perry W. Thorndyke, and Robert E. Wesson Jun. 1981 59 p refs
(Contract MDA903-78-C-0029; ARPA Order 3640)
(AD-A108611; RAND/R-2728-ARPA; LC-81-13913; ISBN-0-8330-0353-4) Avail: NTIS HC A04/MF A01 CSCL 17/7

Distributed planning and control techniques provide potential advantages over centralized processing in speed, cost, reliability, flexibility, and minimization of long-distance communications for a variety of tasks, including military threat assessment, command and control decisionmaking, disaster relief coordination, and civilian air traffic control. Six different architectures for distribution of control among multiple processors are presented, and the influences of different task environments on each are discussed. The work focuses primarily on the use of distributed planning and control for civilian air traffic control. One architecture, in which each aircraft is controlled by a separate processor, is described in detail in an illustrative scenario. An initial system design is presented in which cooperating 'experts' comprise a processor. These cooperating experts sense or infer aircraft intentions, generate and evaluate plans, control and monitor plan execution, and communicate with other processors. Author (GRA)

N82-18196# Army Missile Command, Redstone Arsenal, Ala. Guidance and Control Directorate.
SOFTWARE FEATURES APPLICABLE TO INERTIAL MEASUREMENT UNIT SELF ALIGNMENT
H. V. White, J. C. Hung, and W. G. Cantrell Dec. 1980 36 p refs
(AD-A108511; AD-E950182; DRSMI/RG-81-11-TR) Avail: NTIS HC A03/MF A01 CSCL 12/1

This report documents two software features applicable to inertial measurement unit self-alignment. Features are the continuous-time algorithm and the 'scraping' technique. FORTRAN programs for least-square with and without scraping are included. Author (GRA)

N82-18197# Nebraska Univ., Lincoln. Dept. of Electrical Engineering.
IMPROVEMENTS AND EXTENSIONS OF THE GEOMETRICAL DILUTION OF PRECISION (GDOP) CONCEPT FOR SELECTING NAVIGATION MEASUREMENTS Final Report, 1 May 1980 - 1 May 1981
William L. Brogan Wright-Patterson AFB, Ohio AFWAL Sep. 1981 69 p refs
(Contract F33615-80-C-1092; AF Proj. 6095)
(AD-A108607; AFWAL-TR-81-1142) Avail: NTIS HC A04/MF A01 CSCL 17/7

The optimal measurement selection problem was studied for the Global Positioning Satellite system (GPS). The fundamentals of the Geometrical Dilution of Precision (GDOP) concept were briefly reviewed, because GDOP is frequently used to rank the effectiveness of potential measurements. It is shown that GDOP does not always select the best measurements in the sense of minimum mean square navigation error. For this reason weighted least-squares and minimum variance (Kalman filter) methods were used to derive several improved measurement ranking schemes. Nonuniform measurement noise and a prior knowledge about the state are taken into account. Any specified weighted combination of the component error variances can be minimized. Eigenvalue-eigenvector theory was used to derive useful bounds and to provide geometrical insight. A purely algorithmic approach is also presented and applied to a number of representative GPS cases. GRA

N82-18198# European Space Agency, Paris (France).
A POSSIBLE WAY OF SPECIFICALLY CORRECTING LOCATION AND NAVIGATIONAL ERRORS CAUSED BY REFLECTION AND OTHER PROPAGATION ANOMALIES
Fritz Stelzel Jul. 1981 125 p refs Transl. into ENGLISH of "Uber eine Moeglichkeit zur gezielten Korrektur von Ortungs- u. Navigationsfehlern, die durch Reflexionen u. sonstige Ausbreitungsanomalien verursacht werden", Rept. DFVLR-Mitt-79-17 DFVLR, Oberpfaffenhofen, West Germany, May 1979
(ESA-TT-667; DFVLR-Mitt-79-17) Avail: NTIS HC A06/MF A01; DFVLR, Cologne DM 21,20

Electromagnetic wave propagation in urban areas is discussed in relation to vehicle location. Current methods are reviewed for vehicles on a arbitrary route. Isophase and hyperbola systems are compared. The isophase system is more accurate. A correction procedure for multipath induced errors is presented, based on measuring time signals from four transmitters. The use of measured times in order to reduce location errors caused by propagation anomalies is described. The methods were tested on a simulated city area covered by transmitters on the corners of a 25 km square. Results are inconclusive. Author (ESA)

N82-18199# European Space Agency, Paris (France).
EXTENSION OF PROPORTIONAL NAVIGATION BY THE USE OF OPTIMAL FILTERING AND CONTROL METHODS
Hans-Dieter Joos Aug. 1981 31 p refs Transl. into ENGLISH of "Erweiterung der Proportionalnavigation durch Anwendung optimaler Filterungs- und Regelungsmethoden", Rept. DFVLR-FB-80-10 DFVLR, Oberpfaffenhofen, West Germany, Mar. 1980 38 p
(ESA-TT-683; DFVLR-FB-80-10) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 8,30

A suboptimal guidance law for homing missiles, based on quadratic optimal stochastic control theory is investigated. On-line backward integration from final time to actual time is not required. A Kalman-Bucy filter which takes nonlinearity and target maneuvers into account is presented. The model is compared to the conventional and extended proportional navigation systems (simulated on a nonlinear guidance loop model). Positional error behavior improves by 45%. Author (ESA)

N82-18200# European Space Agency, Paris (France).
MIDAIR AND NEAR MIDAIR COLLISIONS ON TWO- AND THREE-DIMENSIONAL CURVILINEAR FLIGHT PATHS
Otto Weber Aug. 1981 119 p refs Transl. into ENGLISH of "Zusammenstoesse und gefaehrliche Begegnungen bei zwei- und dreidimensionalen Kurvenfluegen", Rept. DFVLR-FB-80-13 DFVLR, Brunswick, Mar. 1980 107 p
(ESA-TT-686; DFVLR-FB-80-13) Avail: NTIS HC A06/MF A01; DFVLR, Cologne DM 21

Collision avoidance by the see and avoid concept, advanced for a touring role. For business flying, a high cruise speed is favored and so a turbocharged version was also considered. The performance level attainable, with two 200 h.p. turbocharged engines, compares well with the competition. However, at an AUW of 3700 lb, certain modifications to the wing are necessary. The indication is that the Marshal is a commercially viable project. Author (ESA)

N82-19216# Bristol Univ. (England). Dept. of Aeronautical Engineering.
DESIGN STUDY INTO A HIGH ENDURANCE MINI-ROTORCRAFT B.S. Thesis
D. A. E. Beedell and J. C. Handy Jun. 1981 71 p refs
Original contains color illustrations
(BU-265) Avail: NTIS HC A04/MF A01

Competing models in a minirotorcraft competition for maximum endurance with an all up weight no greater than 5 kg, must fly above a height of 5 m within an area 10 m square are discussed. A design in which aerodynamics, stability and control, and mechanical and structural aspects are considered to obtain the size and angular velocity of the rotor for minimum power, while sufficient stability and control for a long flight are still inherent in the overall system is presented. Weights of individual components are also examined. It is found that a rotor mounted engine configuration, with rotor radius about 1.6 m and rotational velocity 4 to 5 revs/sec, with engines half way along the rotors and with Hiller control rotors, is the most promising design. The possible endurance is some 12 hr and hence pilot error and mechanical failure become deciding factors. Author (ESA)

N82-19217*# Mitre Corp., McLean, Va.
A CONCEPT FOR A FUEL EFFICIENT FLIGHT PLANNING AID FOR GENERAL AVIATION Final Report
B. P. Collins, A. L. Haines, and C. J. Wales Washington NASA Mar. 1982 96 p refs
(Contract NAS1-16430)
(NASA-CR-3533; MTR-81W233) Avail: NTIS HC A05/MF A01 CSCL 01D

A core equation for estimation of fuel burn from path profile data was developed. This equation was used as a necessary ingredient in a dynamic program to define a fuel efficient flight path. The resultant algorithm is oriented toward use by general aviation. The pilot provides a description of the desired ground track, standard aircraft parameters, and weather at selected waypoints. The algorithm then derives the fuel efficient altitudes and velocities at the waypoints. B.W.

N82-19218# Institute for Defense Analyses, Arlington, Va.
ASSESSMENT OF AVIONIC EQUIPMENT FIELD RELIABILITY AND MAINTAINABILITY AS FUNCTIONS OF UNIT COST
Mark I. Knapp and Joseph W. Stahl 7 Oct. 1981 24 p refs
Presented at the 16th Ann. Dept. of Defense Cost Analysis Symp., Arlington, Va., 4-7 Oct. 1981
(AD-A109373) Avail: NTIS HC A02/MF A01 CSCL 01/3

Pound-for-pound, avionics is generally recognized as the most expensive, complex and sophisticated part of an aircraft. Reliability and maintainability are critical characteristics that influence spares provisioning, maintenance resource requirements, system operational availability and, ultimately, investment and operating costs. Consequently, much attention has been focused upon improving the reliability and maintainability of avionics which, in the past, have been disappointingly low. This paper addresses avionics reliability and maintainability. The analysis was performed last year in partial response to a request of IDA by OASD (C(3)I) to provide information for use by DSARC principals at the Full-Scale Development milestone. Since the 5000 series of DoD Directives and Instructions emphasize analytical comparisons of any new systems under consideration by the DSARC with current, comparable systems, we undertook analyses to determine if there may be one or more historical relationships between field reliability and maintainability and avionic equipment characteristics that would assist in forecasting those attributes. GRA

N82-19219# European Space Agency, Paris (France).
EQUIPMENT FOR TESTING AND MEASURING A 'HELMET MOUNTED SIGHT AND DISPLAY' SYSTEM WITH A COUPLED MOVABLE TV CAMERA IN THE FLIGHT SIMULATOR FOR RESEARCH OF THE DFVLR
Friedrich Erdmann, R. Dierke, E. Biertuempel, R. Ehlers, and H. Loehr Nov. 1981 70 p refs Transl. into ENGLISH of "Ein Versuchsaufbau zum Ausmessen eines 'Helmet Mounted Sight/Display' mit Nachgeschaltetem Kameraschwenkrahmen im Forschungsflugsimulator der DFVLR" Rept. DFVLR-Mitt-80-04 DFVLR, Brunswick, Jan. 1980 Original report in GERMAN previously announced as ESA-86301
(ESA-TT-675; DFVLR-Mitt-80-04) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 17,40

A test installation capable of static and dynamic measurements on a helmet mounted sight and display (HMS/D) during simulated helicopter motion, by means of a steerable camera rotation framework was built. The rotation frame is gyro controlled and moves about two axes (in pitch and yaw). The HMS/D generates the helmet line of sight referred to the simulator platform (the aircraft based system) in terms of azimuth and elevation. Through the helmet mounted display, using a semitransparent mirror, an electronically produced cross hair (the helmet mounted sight) is superimposed on the image in the right eye of the pilot. The TV picture is also reflected into his eye, enabling him to aim at a target on the sensor image. Test equipment accuracy is 40 min in azimuth, 20 min in elevation. Author (ESA)

N82-19220*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DILUTION JET BEHAVIOR IN THE TURN SECTION OF A REVERSE FLOW COMBUSTER
Steven M. Riddlebaugh, Abraham Lipshitz (Ahuza, Haifa, Israel), and Issac Greber (Case Western Reserve Univ., Cleveland, Ohio) Jan. 1982 15 p refs Presented at the 20th Aerospace Sci. Meeting, Orlando, Fla., 10-14 Jan. 1982; sponsored by AIAA
(NASA-TM-82776; E-1107; AIAA-82-0192) Avail: NTIS HC A02/MF A01 CSCL 21E

Measurements of the temperature field produced by a single jet and a row of dilution jets issued into a reverse flow combustor are presented. The temperature measurements are presented in the form of consecutive normalized temperature profiles, and jet trajectories. Single jet trajectories were swept toward the inner wall of the turn, whether injection was from the inner or outer wall. This behavior is explained by the radially inward velocity component necessary to support irrotational flow through the turn. Comparison between experimental results and model calculations showed poor agreement due to the model's not including the radial velocity component. A widely spaced row of jets produced trajectories similar to single jets at similar test conditions, but as spacing ratio was reduced, penetration was reduced to the point where the dilution jet flow attached to the wall. Author

N82-19221*# Garrett Turbine Engine Co., Phoenix, Ariz.
COOLED VARIABLE-AREA RADIAL TURBINE TECHNOLOGY PROGRAM Final Report
G. D. Large and L. J. Meyer Jan. 1982 303 p refs
(Contract NAS3-22004)
(NASA-CR-165408) Avail: NTIS HC A14/MF A01 CSCL 21E

The objective of this study was a conceptual evaluation and design analyses of a cooled variable-area radial turbine capable of maintaining nearly constant high efficiency when operated at a constant speed and pressure ratio over a range of flows corresponding to 50- to 100-percent maximum engine power. The results showed that a 1589K (2400 F) turbine was feasible that would satisfy a 4000-hour duty cycle life goal. The final design feasibility is based on 1988 material technology goals. A peak aerodynamic stage total efficiency of 0.88 was predicted at 100 percent power. Two candidate stators were identified: an articulated trailing-edge and a locally movable sidewall. Both concepts must be experimentally evaluated to determine the optimum configuration. A follow-on test program is proposed for this evaluation. Author

N82-19222*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF SINGLE-STAGE AXIAL-FLOW TRANSONIC COMPRESSOR WITH ROTOR AND STATOR ASPECT RATIOS OF 1.63 AND 1.78, RESPECTIVELY, AND WITH DESIGN PRESSURE RATIO OF 1.82
Royce D. Moore and Lonnie Reid Feb. 1982 112 p refs
(NASA-TP-1974; E-259) Avail: NTIS HC A06/MF A01 CSCL 21E

The overall and blade-element performance of a transonic compressor stage is presented over the stable operating flow range for speeds from 50 to 100 percent of design. The stage was designed for a pressure ratio of 1.82 at a flow 20.2 kg/sec and a tip speed of 455 m/sec. At design speed the stage achieved a peak efficiency of 0.821 at a pressure ratio of 1.817. The stage stall margin at design speed based on conditions at stall and peak efficiency was about 11 percent. Author

N82-19223 Royal Aircraft Establishment, Farnborough (England).
A CRITERION FOR THE PREDICTION OF THE RECOVERY CHARACTERISTICS OF SPINNING AIRCRAFT
T. H. Kerr 1981 24 p refs
(RAE-TN-AERO-2251) Copyright. Avail: Issuing Activity

Full scale spinning tests were analyzed in order to produce a recovery estimation method for straight and swept wing aircraft. The rate of rotation about spin axis X wing span/true rate of descent in ft/sec, was estimated from the general layout and loading of the aircraft. Antispin rolling moment coefficient (wind axis) due to the body at a mean incidence of 45 deg and antispin moment due to the movement of the rudder from neutral to fully antispin were calculated. The unbalanced (antispin) rolling moment coefficient is derived. This is plotted against (I- (pitching moment of inertia/rolling moment of inertia)) and whether the aircraft is likely to have a satisfactory spin recovery characteristic is assessed by reference to the empirical boundary tables provided. Data for Spitfire and Hurricane aircraft are provided. Recovery standards improve as pitching moment of inertia/rolling moment of inertia increases. Author (ESA)

N82-19224*# Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
AN EXPERIMENTAL STUDY OF THE EFFECT OF TAIL CONFIGURATION ON THE SPINNING CHARACTERISTICS OF GENERAL AVIATION AIRCRAFT M.S. Thesis
Mark G. Ballin Mar. 1982 182 p refs
(Grant NAG1-73)
(NASA-CR-168578) Avail: NTIS HC A09/MF A01 CSCL 01C

The feasibility of using static wind tunnel tests to obtain information about spin damping characteristics of an isolated general aviation aircraft tail was investigated. A representative tail section was oriented to the tunnel free streamline at angles simulating an equilibrium spin. A full range of normally encountered spin conditions was employed. Results of parametric studies performed to determine the effect of spin damping on several tail design parameters show satisfactory agreement with NASA rotary balance tests. Wing and body interference effects are present in the NASA studies at steep spin attitudes, but agreement improves with increasing pitch angle and spin rate, suggesting that rotational flow effects are minimal. Vertical position of the horizontal stabilizer is found to be a primary parameter affecting yaw damping, and horizontal tail chordwise position induces a substantial effect on pitching moment. A.R.H.

N82-19225*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMULATOR STUDY OF VORTEX ENCOUNTERS BY A TWIN-ENGINE, COMMERCIAL, JET TRANSPORT AIRPLANE
Earl C. Hastings, Jr. and Gerald L. Keyser, Jr. Feb. 1982 65 p refs
(NASA-TP-1966; L-14187) Avail: NTIS HC A04/MF A01 CSCL 01C

A simulator study of vortex encounters was conducted for a twin-engine, commercial, jet transport airplane encountering the vortex flow field of a heavy, four-engine, commercial, jet transport airplane in the final-approach configuration. The encounters were conducted with fixed controls and with a pilot using a state-of-the-art, manual-control system. Piloted encounters with the base-line vortex flow field out of ground effect (unattenuated) resulted in initial bank-angle excursions greater than 40 deg, coupled with initial sideslip-angle excursions greater than 10 deg. The severity of these initial upsets was significantly reduced when the vortex center was moved laterally or vertically away from the flight path of the encountering airplane. Smaller reductions occurred when the flow field was attenuated by the flight spoilers on the generating airplane. The largest reduction in the severity of the initial upsets, however, was from aging in ground effect. The severity of the initial upsets of the following airplane was relatively unaffected by the approach speed. Increasing the lift coefficient of the generating airplane resulted in an increase in the severity of the initial upsets. Author

N82-19226*# Boeing Aerospace Co., Kent, Wash.
A STUDY OF FLIGHT CONTROL REQUIREMENTS FOR ADVANCED, WINGED, EARTH-TO-ORBIT VEHICLES WITH FAR-AFT CENTER-OF-GRAVITY LOCATIONS Final Report
Andrew K. Hepler, Howard Zeck, William H. Walker, and Alexander Polack Washington NASA Feb. 1982 121 p
(Contract NAS1-16128)
(NASA-CR-3491) Avail: NTIS HC A06/MF A01 CSCL 01C

Control requirements of Controlled Configured Design Approach vehicles with far-aft center of gravity locations are studied. The baseline system investigated is a fully reusable vertical takeoff/horizontal landing single stage-to-orbit vehicle with mission requirements similar to that of the space shuttle vehicle. Evaluations were made to determine dynamic stability boundaries, time responses, trim control, operational center of gravity limits, and flight control subsystem design requirements. Study tasks included a baseline vehicle analysis, an aft center of gravity study, a payload size study, and a technology assessment. Author

N82-19227# Purdue Univ., Lafayette, Ind. School of Aeronautics and Astronautics.
FLUTTER AND TIME RESPONSE ANALYSES OF THREE DEGREE OF FREEDOM AIRFOILS IN TRANSONIC FLOW Final Report, Nov. 1979 - Dec. 1980
T. Y. Yang and C. H. Chen Wright-Patterson AFB, Ohio AFWAL Aug. 1981 60 p refs
(Grant AF-AFOSR-3523-78; AF Proj. 2307)
(AD-A108867; AFWAL-TR-81-3103) Avail: NTIS HC A04/MF A01 CSCL 20/4

Flutter and time response analyses are performed for a NACA 64A006 conventional and a MBB A-3 supercritical airfoil, both oscillating with plunge, pitch, and aileron pitch d.o.f.'s in small disturbance, transonic flow. The aerodynamic coefficients are calculated using the transonic code LTRAN2-NLR. The effects of various kinds of aeroelastic parameters on flutter speeds for the bending-torsion, bending-aileron, and torsion-aileron branches are studied. The flutter speeds associated with the bending-torsion branch are plotted against Mach number for different parameter values. The flutter speed, the amplitude ratio, and the phase difference at different Mach numbers are plotted against the mass ratio for both of two d.o.f. and a three d.o.f. case. Time-response results are obtained for the NACA 64A006 and the MBB A-3 airfoils at M = 0.85 and 0.765, respectively. Using the same sets of parameter values, the flight speeds used to obtain all the neutrally stable response are very close to the flutter speeds obtained in the flutter analysis. The principle of linear superposition of airloads is used in the flutter analysis but not in the response analysis. Author (GRA)

N82-19228# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
ACTIVE GUST AND MANEUVER LOAD CONTROL CONCEPTS WITH THE EXAMPLE OF THE AIRBUS A300. PART 1: EXPLANATION OF A REGULAR IN THE TIME ZONE OF WIND GUST LOAD DECREASE AND EXAMINATION OF ITS EFFECTIVENESS IN STOCHASTIC GUSTS [AKTIVE BOEEN- UND MANOEVERLASTREGELUNGSKONZEPTE AM BEISPIEL DES AIRBUS A-300. TEIL1: AUSLEGUNG EINES REGLERS IM ZEITBEREICH ZUR BOENLASTMINDERUNG UND NACHPRUEFUNG DER WIRKSAMKEIT FUER STOCHASTISCHE BOEEN]
J. Becker, O. Sensburg, and F. Weiss 28 Apr. 1981 60 p refs In GERMAN Presented at DGLR-Jahrestagung 1981, Aachen, 11-14 May, 1981
(MBB-FE-172/S/PUB/38-Pt-1) Avail: NTIS HC A04/MF A01

The development of active control technology and its application to flutter stabilization in aviation as well as maneuvering squall load control in the structural reduction and improvement of flying comfort was investigated. The design of the squall load control, and the plotting of the simulation model for the flexible airplane are examined. Transl. by E.A.K.

N82-19231# Bristol Univ. (England). Dept. of Aeronautical Engineering.
THE PRESSURE SIGNATURE METHOD FOR BLOCKAGE CORRECTIONS, AND ITS APPLICATIONS TO THE INDUSTRIAL WIND TUNNEL B.S. Thesis
A. S. Walker and N. P. Wiseman Jun. 1981 43 p refs
([illegible]) Avail: NTIS HC A03/MF A01

secondary radar systems on the ground, and independent electronic systems onboard are discussed. For two and three dimensional stationary turns, basic geometrical and physical aspects of conflict detection are derived and details are given on the apparent size and motion of the other aircraft on the windshield. For conflict warning by means of ground based or onboard electronic systems, a linear track model is used. The predicted minimum distance at the closest approach, the lead times to this event or to the penetration of a zone of protection around the intruder, and the zeta parameter are analyzed as potential conflict criteria. Similarity rules and the separation of three dimensional conflicts into horizontal and vertical problems are treated. Commercial pilots lack special training in optically based risk assessment. Autonomous onboard warning systems do not make the see and avoid concept obsolete. Author (ESA)

N82-18201# National Ocean Survey, Rockville, Md.
UNITED STATES COAST PILOT 9. PACIFIC AND ARCTIC COASTS ALASKA: CAPE SPENCER TO BEAUFORT SEA
Jan. 1981 425 p Revised
(PB82-109562; NOAA-81021105) Avail: NTIS HC A18/MF A01 CSCL 17G

Coast Pilot subjects include navigation regulations, outstanding landmarks, channel and anchorage peculiarities, dangers, weather, ice, freshets, routes, pilotage, and port facilities. Information is included on navigation regulations, Cape Spencer to Beaufort Sea, Cape Spencer to Cook Inlet, Kodak Island, Alaska Peninsula, Aleutian Islands, Bering Sea and Arctic Ocean. GRA

N82-18202*# McDonnell-Douglas Corp., Long Beach, Calif.
A STUDY TO DEFINE THE RESEARCH AND TECHNOLOGY REQUIREMENTS FOR ADVANCED TURBO/PROPFAN TRANSPORT AIRCRAFT Final Report
Irene M. Goldsmith Feb. 1981 313 p refs
(Contract NAS2-10078)
(NASA-CR-166138; ACEE-16-FR-0016) Avail: NTIS HC A14/MF A01 CSCL 01C

The feasibility of the propfan relative to the turbofan is summarized, using the Douglas DC-9 Super 80 (DS-8000) as the actual operational base aircraft. The 155 passenger economy class aircraft (31,775 lb [14,413 kg] payload), cruise Mach at 0.80 at 31,000 ft (8,450 m) initial altitude, and an operational capability in 1985 was considered. Three propfan arrangements, wing mounted, conventional horizontal tail aft mounted, and aft fuselage pylon mounted are selected for comparison with the DC-9 Super 80 P&WA JT8D-209 turbofan powered aircraft. The configuration feasibility, aerodynamics, propulsion, structural loads, structural dynamics, sonic fatigue, acoustics, weight maintainability, performance, rough order of magnitude economics, and airline coordination are examined. The effects of alternate cruise Mach number, mission stage lengths, and propfan design characteristics are considered. Recommendations for further study, ground testing, and flight testing are included. Author

N82-18203*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SLOTTED VARIABLE CAMBER FLAP Patent Application
Dana G. Andrews, inventor (to NASA) (Boeing Commercial Airplane Co., Seattle) Filed 30 Oct. 1981 13 p Sponsored by NASA
(NASA-Case-LAR-12541-1; US-Patent-Appl-SN-315588) Avail: NTIS HC A02/MF A01 CSCL 01C

Variable camber actuator assemblies broaden the range of speeds at which lift to drag performance is maximized for slotted flap wings. Lift is improved by varying wing camber with rotational flap movements that do not introduce wing slots and induced drag. Forward flaps are secured to forward flange links which extend from, and are a part of, forward flap linkage assemblies. The forward flaps rotate about flap pivots with their rotational displacement controlled by variable camber actuator assemblies located between the forward flaps and the forward flange links. Rear flaps are held relative to the forward flaps by rear flap linkage assemblies which may act independently from the forward flap linkage assemblies and the variable camber actuator assemblies. Wing camber is varied by rotating the flaps with the variable camber actuator assemblies while the flaps are in a deployed or tucked position. Rotating flaps in a tucked position does not introduce significant wing surface discontinuities, and reduces aircraft fuel consumption on most flight profiles. NASA

N82-18204*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DYNAMICS OF AIRCRAFT ANTISKID BRAKING SYSTEMS
John A. Tanner, Sandy M. Stubbs, Robert C. Dreher, and Eunice G. Smith Feb. 1982 100 p refs
(NASA-TP-1959; L-14788) Avail: NTIS HC A05/MF A01 CSCL 01C

A computer study was performed to assess the accuracy of three brake pressure-torque mathematical models. The investigation utilized one main gear wheel, brake, and tire assembly of a McDonnell Douglas DC-9 series 10 airplane. The investigation indicates that the performance of aircraft antiskid braking systems is strongly influenced by tire characteristics, dynamic response of the antiskid control valve, and pressure-torque response of the brake. The computer study employed an average torque error criterion to assess the accuracy of the models. The results indicate that a variable nonlinear spring with hysteresis memory function models the pressure-torque response of the brake more accurately than currently used models. T.M.

N82-18205# Committee on Armed Services (U. S. House).
REVIEW OF DEFENSE-RELATED VERTICAL AND SHORT TAKEOFF AND LANDING (V/STOL) AIRCRAFT PROGRAMS
Walter Z. Collings Washington GPO 1979 206 p refs Presented to the Comm. on Armed Serv., 96th Congr., 1st Sess., Sep. 1978 Prepared by AIAA, New York
(GPO-55-278) Avail: Committee on Armed Services

A technology review of bases supporting the development of Vertical of Short Takeoff and Landing (V/STOL) aircraft is presented. Representative aircraft were summarized according to their type of lift generation mechanisms. Successes, failures, problems encountered in development, and plans for the future are also presented. Some discussion of the Navy's envisionment/commitment to V/STOL aircraft is also presented. M.D.K.

N82-18206# Rockwell International Corp., Columbus, Ohio. Aircraft Div.
XFV-12A DIAGNOSTIC AND DEVELOPMENT PROGRAMS Summary Report, Jan. 1979 - May 1981
P. M. Bevilaqua and C. P. Combs Nov. 1981 367 p refs
(Contract N00019-73-C-0053)
(AD-A108354; NR81H-50) Avail: NTIS HC A16/MF A01 CSCL 01/3

Activity during the XFV-12A thrust augmenter development program conducted from May 1979 to June 1981 is reported and documented. Diagnostic tests indicated a major source of performance deficiency could be attributed to feed duct/augmenter component interface problems rather than basic augmenter configuration. Interface problems seriously affected both isolated performance and flow quality of the primary augmenter nozzles resulting in significantly low levels of augmentation. A remedial program, the subject of this report, was initiated. The primary objective of this program was to systematically improve the performance of the XFV-12A aircraft's thrust augmenter lift systems. Major emphasis was placed not only on correcting flow deficiencies but also identifying and incorporating improvements in the augmenter design which would increase its performance potential. GRA

N82-18207# General Accounting Office, Washington, D. C.
POTENTIAL REDUCTIONS IN AIRCRAFT OPERATION AND MAINTENANCE COSTS BY USING THRUST COMPUTING SUPPORT EQUIPMENT Report to the Honorable Joseph P. Addabbo, Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives
27 Oct. 1981 17 p
(AD-A108463; GAO/PLRD-82-4) Avail: NTIS HC A02/MF A01 CSCL 01/2

This report addresses the evaluation of thrust measuring equipment. We interviewed Air Force officials and contractor representatives, reviewed documentation pertaining to the key events in the evaluation of the thrust computing system program, reviewed test data and analyses by Air Force and contractor engineers, and observed the operation of the thrust computing system. Our analyses show that the accurate measurement and setting of thrust for installed jet engines is of vital importance not only for aircraft readiness and safety but also for operation and maintenance cost reductions. Although test results indicate

that a system is available that can perform such measurements, the services have not been using it. The Air Force has conducted extensive tests that will measure thrust for installed J85-5 engines, but has not implemented a system. The Navy has not performed any tests to determine whether its aircraft jet engines might benefit from such a system.
GRA

N82-18208# Institute for Defense Analyses, Arlington, Va. Systems Evaluation Div.
C-5A AUSTERE AIRFIELD OPERATIONAL UTILITY EVALUATION. PHASE 2: OPERATION ON UNPAVED SOIL SURFACES FOLLOWING RAINFALL Final Report
Waldemar O. Breuhaus Oct. 1981 46 p refs
(Contract MDA903-79-C-0018)
(AD-A108597; AD-E500466; IDA-P-A1621; IDA/HQ-81-23896) Avail: NTIS HC A03/MF A01 CSCL 01/3

During the summer of 1980 and the winter of 1980-1981, an Operational Utility Evaluation (OUE) was conducted to determine operating characteristics of the C-5A airplane when taxiing or being towed and off-loaded on unpaved soil surfaces and on snow-covered surfaces. Subsequent to the successful completion of those tests, questions arose concerning the effects of rainfall that wets otherwise adequate bare soil areas to a significant depth. Tests with simulated rainfall of various amounts applied by agricultural sprinkler systems were conducted at March AFB, California, during July 1981. The airplane performed well, though it approached its performance limits in the most severe test conditions. Difficulties were encountered in arriving at a sprinkler system configuration reasonably approximating naturally occurring rainfall, and in arriving at a single simple descriptor to properly characterize the strength of soil in such a complex situation.
GRA

N82-18209# Army Aeromedical Research Lab., Fort Rucker, Ala. Biodynamics Research Div.
VIBRATION LEVELS IN ARMY HELICOPTERS: MEASUREMENT RECOMMENDATIONS AND DATA Final Report
John C. Johnson and David B. Priser Sep. 1981 35 p refs
(DA Proj. 3E1-6277-A-878)
(AD-A108131; USAARL-81-5) Avail: NTIS HC A03/MF A01 CSCL 01/3

Surveys on vibration levels found in currently fielded helicopters were used to prepare a comparative summary of vibration exposure levels at crew stations and of the test methods used to measure these levels. This effort was initiated at the request of the Air Standardization Coordinating Committee (ASCC) Working Party 61 and because of the wide variety of methods used in data capture and instrumentation documentation. Sources of the literature reviewed included technical reports of U.S. Government agencies and papers in open literature. Articles were reviewed based upon three criteria: (1) quantitative description of vibration in currently fielded U.S. Army rotary winged aircraft, (2) article contents are unclassified and available for publication in open literature, (3) article describes human exposure levels of aircraft vibration.
Author (GRA)

N82-18210# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Flight Technology Div.
A DIGITAL SIMULATION PROGRAM DESCRIBING THE MOTION OF AN AIRCRAFT UNDERGOING ENGINE FAILURE DURING ITS TAKEOFF GROUND ROLL Final Report, Jun. 1980 - Mar. 1981
Michael J. Miedler Sep. 1981 77 p refs
(AD-A108420; ASD-TR-81-5030) Avail: NTIS HC A05/MF A01 CSCL 01/2

This report presents a non-interactive 'MIMIC' program developed to generate the time history of an aircraft undergoing an engine failure during its ground roll. The program calculates the forces and moments acting on the aircraft, and uses MIMIC's implicit integration routine to track its motion. The equations and assumptions used are presented and discussed. This report also lists the program and delineates its functions. Author (GRA)

N82-18211# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
THEORETICAL INVESTIGATIONS ON THE INFLUENCE OF DIFFERENT STRAKE, TAIL UNIT, AND CONVENTIONAL HLW ARRANGEMENT AS WELL AS OF CCV ON THE AERODYNAMIC CHARACTERISTICS OF FIGHTER AIRCRAFT CONFIGURATIONS Thesis - Hochschule der Bundeswehr, Munich [THEORETISCHE UNTERSUCHUNGEN UEBER DEN EINFLUSS VON VERSCHIEDENEN STRAKE, ENTENLEITWERKS- UND KONVENTIONELLEN HOEHENLEITWERKSANORDNUNGEN SOWIE VON C.C.V. AUF DIE AERODYNAMISCHEN EIGENSCHAFTEN VON KAMPFFLUGZEUG-KONFIGURATIONEN]
Herbert Klimt, Dieter Oberst, and Walter Schmalhofer 1 Oct. 1980 486 p refs In GERMAN
(MBB-FE-122/S/PUB/30) Avail: NTIS HC A01/MF A01

Linear and nonlinear aerodynamic characteristics for fighter airplane configurations with three separate tail-wing-surface ratios as related to lift coefficients were optimized. The optimal configurations were reduced by 8% for stability and 10% for instability and their lifting responses are compared. Fuselage effect and convergence of aerodynamic factors are also studied.
Transl. by E.A.K.

N82-18212# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
INTERPRETATION AND CONSTRUCTION OF A DYNAMIC SIMILARITY MODEL OF THE A 310 WINGS [AUSLEGUNG UND BAU EINES DYNAMISCH AEHNLICHEN MODELLS DES A 310 FLUEGELS]
H. Hoenlinger 5 May 1981 34 p refs In GERMAN Presented at DGLR-Jahrestagung 1981, Aachen, 11-14 May 1981
(MBB-FE-17/S/PUB/42; DGLR-81-035) Avail: NTIS HC A03/MF A01

The design and construction of a model for directional oscillation flutter for the A-310 wing with supercritical profile is discussed. The rigidity distribution in the model is simulated by a simple metal box. The profile geometry and the mass distribution of the model is copied exactly by a foam structure coated with a fiberglass laminate. A finite element model is used to explain the complicated engine mount, which is supported by a profile beam. Data on rigidity and vibration measurements are included.
Transl. by E.A.K.

N82-18213# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).
CHARACTERIZATION OF THE AIRBUS HORIZONTAL STABILIZERS OF CFRP CONSTRUCTION AND STRUCTURAL ANALYSIS WITH THE FINITE ELEMENT METHOD [AUSLEGUNG DES AIRBUSSEITENLEITWERKS IN CFK-BAUWISE UND STRUKTURANALYSE MIT DER FINITE-ELEMENTE-METHODE]
Erhard Winkler May 1981 22 p Reprint from "Verarbeiten u. Anwenden kohlenstoffaserverstaerkter kunststoffe" Vereins Deut. Ingr., May 1981 p 181-198 In GERMAN
(MBB-UT-13-81-O) Avail: NTIS HC A02/MF A01

The use of carbon fiber reinforced plastics as a substitute for light weight metals in aircraft construction, which decreases the weight by 30%, is discussed. Environmental parameters, like temperature and humidity must be considered. A construction method with a variety of possibilities to fulfill these requirements and which competes with metal structures is developed. This means either a simplified weight reduction at the same or less cost, or a less costly method for the same or less weight.
Transl. by E.A.K.

N82-18214# European Space Agency, Paris (France).
TENDENCIES IN THE DEVELOPMENT OF SUBSONIC TRANSPORT AIRCRAFT WITH SPECIAL CONSIDERATION OF AERODYNAMICS
Horst Koerner Oct. 1981 42 p refs Transl. into ENGLISH of "Entwicklungstendenzen bei Unterschall-Transportflugzeugen unter besonderer Beruecksichtigung der Aerodynamik", Rept. DFVLR-Mitt-80-15 Brunswick, Jun. 1981 62 p
(ESA-TT-706; DFVLR-Mitt-80-15) Avail: NTIS HC A03/MF A01

Tendencies in subsonic transport aircraft development, specifically due to progress in aerodynamics, are surveyed. Prospective wing profile designs and improved integration of body dimensions are considered, citing examples from the AIRBUS development program. Possible fuel savings through supercritical wing technology and by optimizing reduction in friction drag are also studied. Advantages to be gained by active control, particularly from adaptive wing technology, are reviewed. As a potential application, an unconventional canard configuration, including transonic propellers, for an aircraft in the AIRBUS class is proposed.
Author (ESA)

N82-18215 Royal Aircraft Establishment, Farnborough (England).

A recent method of correcting for errors due to blockage, applicable to complex shapes and high blockage ratios, was applied to the Aeronautical Engineering Department industrial wind tunnel. A tunnel centerline, source-sink distribution was derived from measured wall pressure signatures. The interference effect of the tunnel walls was calculated; blockage corrections were applied to in-tunnel measurements of forces and pressures. The drag coefficient of a normal flat plate of deliberately high blockage ratio (12%) was measured in the tunnel, then corrected to the value in unconfined flow. This is found to be close to the expected value and indicates that the pressure signature method can be reliably used to correct measurements obtained from models, up to this value of blockage. The effective body implied by the equivalent potential flow was also calculated. This compares well with the known effective body shapes of flat normal plates in confined flow. Author (ESA)

N82-19343# Federal Aviation Administration, Atlantic City, N.J.
WORKSHOP ON MATHEMATICAL FIRE MODELING
Aug. 1981 227 p Workshop held 24-27 Mar. 1981
(AD-A109876; FAA-CT-81-209) Avail: NTIS
HC A11/MF A01 CSCL 01/2

Computerized simulation of aircraft fires is discussed. Cabin fires are emphasized with particuliar attention given to the study of the flammability of construction materials. Three types of aircraft fires are analyzed: ramp fires, in-flight fires, and post crash fires. Flame spread, heat fluxes, and fire dynamics are discussed. R.J.F.

N82-19366*# Rockwell International Corp., El Segundo, Calif. Aircraft Operations.
EVALUATION OF SUPERPLASTIC FORMING AND CO-DIFFUSION BONDING OF Ti-6Al-4V TITANIUM ALLOY EXPANDED SANDWICH STRUCTURES Technical Report, May 1979 - Dec. 1980
G. H. Arvin, L. Israeli, J. H. Stolpestad, and G. W. Stacher
Sep. 1981 134 p refs
(Contract NAS1-15788)
(NASA-CR-165827; NA-81-185-1) Avail: NTIS
HC A07/MF A01 CSCL 11F

The application of the superplastic forming/diffusion bonding (SPF/DB) process to supersonic cruise research is investigated. The capability of an SPF/DB titanium structure to meet the structural requirements of the inner wing area of the NASA arrow-wing advanced supersonic transport design is evaluated. Selection of structural concepts and their optimization for minimum weight, SPF/DB process optimization, fabrication of representative specimens, and specimen testing and evaluation are described. The structural area used includes both upper and lower wing panels, where the upper wing panel is used for static compression strength evaluation and the lower panel, in tension, is used for fracture mechanics evaluations. The individual test specimens, cut from six large panels, consist of 39 static specimens, 10 fracture mechanics specimens, and one each full size panel for compression stability and fracture mechanics testing. Tests are performed at temperatures of -54 C (-65 F), room temperature, and 260 C (500 F). B.W.

N82-19391# Naval Ship Research and Development Center, Annapolis, Md. Propulsion and Auxiliary Systems Dept.
FOUNDATIONS FOR COMPUTER SIMULATION OF A LOW PRESSURE OIL FLOODED SINGLE SCREW AIR COMPRESSOR M.S. Thesis - Purdue Univ.
Thomas W. Bein Dec. 1981 122 p refs
(AD-A108230; DTNSRDC/PAS-81/24) Avail: NTIS
HC A06/MF A01 CSCL 13/7

The necessary logic to construct a computer model to predict the performance of an oil flooded, single screw air compressor is developed. The geometric variables and relationships used to describe the general single screw mechanism are developed. The governing equations to describe the processes are developed from their primary relationships. The assumptions used in the development are also defined and justified. The computer model predicts the internal pressure, temperature, and flowrates through the leakage paths throughout the compression cycle of the single screw compressor. The model uses empirical external values as the basis for the internal predictions. The computer values are compared to the empirical values, and conclusions are drawn based on the results. Recommendations are made for future efforts to improve the computer model and to verify some of the conclusions that are drawn. Author (GRA)

N82-19396# Engineering Dynamics International, St. Louis, Mo.
AIRPORT RELATED RESIDENTIAL ACOUSTICAL INSULATION DEMONSTRATION PROJECT: REPORT 1720 Final Report
J. T. Weissenburger, J. C. McBryan, and L. F. Heitkamp Jun. 1981 107 p refs Sponsored by St. Louis Airport Authority, Mo.
(PB82-100777) Avail: NTIS HC A06/MF A01 CSCL 13B

A demonstration project to evaluate the feasibility of retrofit acoustical insulation in single family residences as a possible remedial measure for homes impacted by airport and aircraft noise is described. Six private residences generally located in an area to the east and southeast of Lambert St. Louis International Airport were used. The program involved making before and after noise measurements, selecting contractors, and overseeing the installation of selected acoustical controls, and evaluating the effectiveness of the program. A description of each individual house and measured data pertaining to the house is presented. GRA

N82-19419# Radio Technical Commission for Aeronautics, Washington, D. C.
FM BROADCAST INTERFERENCE RELATED TO AIRBORNE ILS, VOR AND VHF COMMUNICATIONS
18 Nov. 1981 96 p refs
(RTCA/DO-176; RTCA/SC-141) Avail: NTIS
HC A05/MF A01

Recommendations for controlling the problem of FM broadcast interference with airborne communications are given.

N82-19420# Radio Technical Commission for Aeronautics, Washington, D. C.
INVESTIGATION OF TECHNICAL REQUIREMENTS
In its FM Broadcast Interference Related to Airborne ILS, VOR and VHF Commun. 18 Nov. 1981 p 7-8

Avail: NTIS HC A05/MF A01

Tolerances and standards applicable to FM broadcast stations are given, and minimum performance standards for airborne receiving equipment are identified. Performance standards for ILS localizer receiving equipment, for VOR receiving equipment operating at 108-118 MHz, and for radio communication receiving equipment operating at 117.975-136.000 MHz are considered. J.D.H.

N82-19421# Radio Technical Commission for Aeronautics, Washington, D. C.
INVESTIGATION OF AIRBORNE VHF COMMUNICATION AND NAVIGATION EQUIPMENT
In its FM Broadcast Interference Related to Airborne ILS, VOR and VHF Commun. 18 Nov. 1981 p 9-22 ref

Avail: NTIS HC A05/MF A01

The Federal Aviation Administration test program investigating the problem of FM broadcast interference is described. The communication signal level to be protected, receiver minimum performance standards, antenna characteristics, and receiver interference tests are described for airborne VHF communications and for ILS and VOR navigation equipment. J.D.H.

N82-19422# Radio Technical Commission for Aeronautics, Washington, D. C.
INVESTIGATION OF THE EFFECTS OF AIRBORNE INSTALLATION FACTORS ON RECEIVER INTERFERENCE
In its FM Broadcast Interference Related to Airborne ILS, VOR and VHF Commun. 18 Nov. 1981 p 23-52

Avail: NTIS HC A05/MF A01

Significant variables which may have an impact on protection criteria are discussed. A rationale for developing voltage limits at a VHF receiver input is presented. A system model consisting of an antenna, transmission line and receiver is developed to define system equations. Distance criteria using model and 100 kW ERP FM broadcast propagation data is developed for various transmission line lengths. J.D.H.

N82-19423# Radio Technical Commission for Aeronautics, Washington, D. C.
FAA/FCC COORDINATION PROCEDURES FOR FM BROADCAST STATIONS
In its FM Broadcast Interference Related to Airborne ILS, VOR and VHF Commun. 18 Nov. 1981 p 53-60

Avail: NTIS HC A05/MF A01

Procedures for coordination between the Federal Aviation Administration and the Federal Communications Commission are given and their effectiveness evaluated. Recommendations for strengthening the present informal coordination procedures are presented. J.D.H.

N82-19448# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
ANTENNA (SELECTED ARTICLES)
4 Nov. 1981 64 p refs Transl. into ENGLISH from Antenny (USSR), no. 15, 1972 p 31-79
(AD-A108174; FTD-ID(RS)T-0940-81) Avail: NTIS HC A04/MF A01 CSCL 20/14

A statistical analysis of field focused systems and the properties of connected vibrator structures was made. The efficiency and input impedance of analyzing and reducing the directive gain and direction dispersion of the main maximum of the beam pattern of a sectional traveling wave antenna were derived and are discussed. An assessment of aircraft capacitive circuit medium wave antennas' efficiency is also presented.

N82-19453# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
ASSESSMENT OF AIRCRAFT CAPACITIVE CIRCUIT MEDIUM WAVE ANTENNAS ACCORDING TO THEIR EFFICIENCY
E. O. Brudnyy and L. Ya. Ilnitskiy *In its* Antenna (Selected Articles) (FTD-ID(RS)T-0940-81) 4 Nov. 1981 p 53-59 refs Transl. into ENGLISH from Antenny (USSR), no. 15, 1972

Avail: NTIS HC A04/MF A01 CSCL 20/14

A method for assessing aircraft capacitive circuit medium wave antennas according to their efficiency is presented. The measure of efficiency is the product of the antenna capacitance times the active altitude. An expression was obtained which links the antenna efficiency to its geometric dimensions. The suggested method discussed produces the optimal dimensions for aircraft capacitive circuit antennas direction during their designing. Author

N82-19670# National Aerospace Lab., Tokyo (Japan).
ACOUSTIC FATIGUE ENDURANCE TEST OF USB FLAP STRUCTURE MODELS AT ELEVATED TEMPERATURE
Masaaki Sano, Yoshinori Fukimori, Soushiro Iida, Keiji Komatsu, and Koichi Egawa Oct. 1981 59 p refs In JAPANESE; ENGLISH summary
(NAL-TR-683) Avail: NTIS HC A04/MF A01

Five substructural models of upper surface blown flaps were tested to verify the safety of the flap structure during a planned flight evaluation of the NAL-STOL experimental aircraft. All models consisted of the face panel with stringers and ribs rivetted on the backside in shape. Four panels were flat; one had the same curvature as the actual flap structure. Three face panels and stiffeners were of Ti-6Al-4V' the others were of 2024C-T3 alloy. Results of thermal buckling tests, resonant frequencies of all panels, the dynamic and the measurement of dynamic strain response are discussed. All structural models proved strong enough to resist both acoustic and thermal loading. No detectable damage was found on the panel face nor around the rivet holes. Estimated lives based on simulated and experimental strain histories suggest confirmation of the fatigue test results. A.R.H.

N82-19671# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Structures and Materials Panel.
PRACTICAL APPLICATIONS OF FRACTURE MECHANICS
Harold Liebowitz, ed. (George Washington Univ.) May 1980 425 p refs
(AGARD-AG-257; ISBN-92-835-1359-2) Avail: NTIS HC A16/MF A01

Practical applications of fracture mechanics for all aspects of aircraft design, manufacture and testing are presented. Although theoretical discussions are included to provide an appreciation of the complexity of the problems involved, the emphasis is on practical examples. Applications to engine components; built-up structures; joints, lugs and fasteners; integral structures and forgings are covered. The effects of stress corrosion and problems of scatter affecting determination of stress concentration factors, fatigue crack propagation and residual strength are discussed. S.L.

N82-19683# Kaman Aerospace Corp., Bloomfield, Conn.
STRUCTURAL SYSTEM IDENTIFICATION TECHNOLOGY VERIFICATION Final Report
N. Giansante, A. Berman, W. G. Flannelly, and E. J. Nagy Ft. Eustis, Va. Army Research and Technology Labs. Nov. 1981 218 p refs
(Contract DAAK51-78-C-0017; DA Proj. 1L1-62209-AH-76) (AD-A109181; R-1631; USAAVRADCOM-TR-81-D-28) Avail: NTIS HC A10/MF A01 CSCL 13/13

Structural system identification is the method of obtaining structural and dynamic mathematical models and improving existing mathematical models using ground vibration test data. The purpose of the subject program was to perform experimental, development, and research work to verify the concepts of structural system identification technology. To accomplish this, system identification techniques were applied to a U. S. Army AH-1G helicopter fuselage to create a mathematical model from ground vibration test data, to improve a reduced model of an existing NASTRAN model of the AH-1G using shake test data, and to test the effectiveness of these new mathematical models in predicting the effects of stiffness and mass changes to the airframe. The results of the program indicate that system identification is a viable and cost-effective technique for developing new models and for improving existing finite-element models of an airframe using ground vibration test data. Author (GRA)

N82-19687# Georgetown Univ., Washington, D.C. Dept. of Civil Mechanical and Environmental Engineering.
FRACTURE AND FATIGUE CHARACTERIZATION OF AIRCRAFT STRUCTURAL MATERIALS UNDER BIAXIAL LOADING Final Scientific Report, 1 Oct. 1976 - 30 May 1980
D. L. Jones and J. Eftis Dec. 1981 204 p refs
(Grant AF-AFOSR-3096-76; AF Proj. 2307)
(AD-A109054; AFOSR-81-0856TR) Avail: NTIS HC A10/MF A01 CSCL 01/3

A general fracture mechanics analysis was performed to examine the influence of biaxial applied loads on the mechanical state of the body. The geometries examined were the single crack and two coplanar cracks with an arbitrary orientation and the cracked shear panel. It was found that the biaxial loads influenced all aspects of the mechanical state of the body, with the exception of the stress intensity factor for a crack oriented parallel to the biaxial load. The extent and nature of the biaxial effect on the crack-tip stress field, stress intensity factor, angle of initial crack extension, crack-tip displacements, elastic strain energy, fracture load and fatigue crack growth rates are all discussed. A biaxial test facility was developed and a considerable number of photoelastic, fracture toughness, and fatigue crack growth rate experiments were performed. Confirmation of the analytical predictions was obtained for the biaxial effects on the crack-tip stress field, the angle of initial crack extension, the fracture load, and the fatigue crack growth rates. The biaxial loads were seen to influence all of these parameters in varying degrees. GRA

N82-19707*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF REPETITION RATE AND IMPULSIVENESS OF SIMULATED HELICOPTER ROTOR NOISE ON ANNOYANCE
Clemans A. Powell and David A. McCurdy Feb. 1982 59 p refs
(NASA-TP-1969; L-14836) Avail: NTIS HC A04/MF A01 CSCL 20A

Annoyance judgements were obtained for computer generated stimuli simulative of helicopter impulsive rotor noise to investigate effects of repetition rate and impulsiveness. Each of the 82 different stimuli was judged at 3 sound pressure levels by 48 subjects. Impulse repetition rates covered a range from 10 Hz to 115 Hz; crest factors covered a range from 3.2 dB to 19.3 dB. Increases in annoyance with increases in repetition rate were found which were not predicted by common loudness or annoyance metrics and which were independent of noise level. The ability to predict effects of impulsiveness varied between the noise metrics and was found to be dependent on noise level. The ability to predict the effects of impulsiveness was not generally improved by any of several proposed impulsiveness corrections. Instead, the effects of impulsiveness were found to be systematically related to the frequency content of the stimuli. A modified frequency weighting was developed which offers improved annoyance prediction. Author

N82-19944*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF FACILITY VARIATION ON THE ACOUSTIC CHARACTERISTICS OF THREE SINGLE STREAM NOZZLES

Orlando A. Gutierrez 1980 38 p refs Presented at the 100th Meeting of the Acoust. Soc. of Am., Los Angeles, 17-21 Nov. 1980
(NASA-TM-81635; E-646) Avail: NTIS HC A03/MF A01 CSCL 20A

The characteristics of the jet noise produced by three single stream nozzles were investigated statistically at the NASA-Lewis Research Center outdoor jet acoustic facility. The nozzles consisted of a 7.6 cm diameter convergent conical, a 10.2 cm diameter convergent conical and an 8-lobe daisy nozzle with 7.6 cm equivalent diameter flow area. The same nozzles were tested previously at cold flow conditions in other facilities such as the Royal Aircraft Establishment (RAE) 7.3 m acoustic wind tunnel. The acoustic experiments at NASA covered pressure ratios from 1.4 to 2.5 at total temperatures of 811 K and ambient. The data obtained with four different microphone arrays are compared. The results are also compared with data taken at the RAE facility and with a NASA prediction procedure. Author

N82-19945# National Aerospace Lab., Tokyo (Japan). Noise and Emission Research Group.

AERODYNAMIC NOISE GENERATED BY JET WING/FLAP INTERACTIONS OF THE EXTERNAL USB CONFIGURATION OF STOL AIRCRAFT. PART 2: FULL SCALE MODEL EXPERIMENT USING FJR710 TURBOFAN ENGINE

Masataka Maita, Shigemi Shindo, Shin Nakayama, Masakatsu Matsuki, Tadao Torisaki, Mitsuo Morita, Akira Yoshida, Katsumi Takeda, Shizuo Sekine, and Hiroshi Kondo Oct. 1981 26 p refs
(NAL-TR-687T-Pt-2; ISSN-0389-4010) Avail: NTIS HC A03/MF A01

Acoustic characteristics of the external upper surface blowing (USB) concept of a propulsive lift configuration were studied by full scale model static experiments. Test components included an FJR710 turbofan engine with an acoustically treated nacelle and a USB wing/flap assembly. These were utilized in conjunction with the ground verification testing of the propulsive systems of the National Aerospace Laboratory Quiet STOL Research Aircraft. Results were compared with the previous 8% scale cold flow model data. The defect of shielding provided by the wing/flap surface on aftradiated turbofan engine noise was studied and some attempts were made to reduce USB noise. Author

N82-19946*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AIRCRAFT NOISE PREDICTION PROGRAM THEORETICAL MANUAL, PART 1

William E. Zorumski Feb. 1982 180 p refs 2 Vol.
(NASA-TM-83199-Pt-1; L-14805-Pt-1) Avail: NTIS HC A09/MF A01 CSCL 20A

Aircraft noise prediction theoretical methods are given. The prediction of data which affect noise generation and propagation is addressed. These data include the aircraft flight dynamics, the source noise parameters, and the propagation effects. R.J.F.

N82-19947*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AIRCRAFT NOISE PREDICTION PROGRAM THEORETICAL MANUAL, PART 2

William E. Zorumski Feb. 1982 296 p refs 2 Vol.
(NASA-TM-83199-Pt-2; L-14805-Pt-2) Avail: NTIS HC A13/MF A01 CSCL 20A

Detailed prediction methods for specific aircraft noise sources are given. These sources are airframe noise, combustion noise, fan noise, single and dual stream jet noise, and turbine noise. Modifications to the NASA methods which comply with the International Civil Aviation Organization standard method for aircraft noise prediction are given. R.J.F.

N82-19952# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

ACOUSTIC MEASUREMENTS OF F100-PW-100 ENGINE OPERATING IN HUSH HOUSE NSN 4920-02-070-2721 Final Report, May - Sep. 1981

Vincent R. Miller, G. A. Plzak, and J. M. Chinn Sep. 1981 58 p refs
(AD-A108814; AFWAL-TM-81-133-FIBE) Avail: NTIS HC A04/MF A01 CSCL 20/1

The purpose of this test program was to measure the acoustic environment in the hush house facility located at Kelly AFB Texas during operation of the F100-PW-100 engine to ensure that engine structural acoustic design limits were not exceeded. The acoustic measurements showed that no sonic fatigue problems are anticipated with the F100-PW-100 engine structure during operation in the hush house. The measured acoustic levels were less than those measured in an existing F100-PW-100 engine wet-cooled noise suppressor, but were increased over that measured during operation on an open test stand. It was recommended that the acoustic load increases measured in this program should be specified in the structural design criteria for engines which will be subjected to hush house operation or defining requirements for associated equipment. Author (GRA)

N82-19956# Loughborough Univ. of Technology (England). Dept. of Transport Technology.

AN EXPERIMENTAL STUDY OF THE EFFECTS OF AN INLET FLOW CONDITIONER ON THE NOISE OF A LOW SPEED AXIAL FLOW FAN

J. Scoles and J. B. Ollerhead Jan. 1981 92 p refs
(Contract AT/2170/049/XR)
(TT-8101) Avail: NTIS HC A05/MF A01

The effects of inflow condition on the noise generated by a 40kW, 560mm diameter, seven blade ducted fan at speeds up to 5000rpm in an anechoic chamber were measured. A 1.25m diameter hemisperical honeycomb flow conditioner (HFC) which could be fitted with an internal gauze liner was used. Fan entry flow was measured by static and rotating hot-wire anemometers. Noise levels in the first few harmonics of blade passing frequency are very sensitive to inflow condition, but the HFC reduces them to a residual level independent of upstream disturbance levels. Broadband noise is reduced (by a smaller amount) at high blade angles and flow rates. No systematic effect of the gauze liner is detected. Experimental difficulties are caused by unsteadiness in the chamber airflow which causes harmonic level fluctuations with amplitudes of up to 10dB. Although the inlet flow conditioner reduces these fluctuations markedly, long term variations reduce confidence in the data. Author (ESA)

N82-19957# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abt. Technische Akustik.

NOISE MEASUREMENTS ON THE HELICOPTER BK 117 DESIGN. WEIGHTED NOISE LEVELS AND INFLUENCE OF AIRSPEED

Wolf R. Splettstoesser, Klaus P. Anders, and Karl-Heinz Spiegel Aug. 1981 93 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-748)
(DFVLR-Mitt-81-18) Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 22,95

Noise measurements on the prototype helicopter BK 117 were performed in strict compliance with the proposed International Civil Aviation Organization regulations for noise certification of helicopters. Measurement procedure, noise data acquisition, analysis and reduction as well as applied correction procedures arc described. Effective perceived noise levels (EPNL) and other noise descriptors were evaluated and related to the proposed noise limits. Additional level flyover tests with variable airspeed were conducted to investigate the resulting effect on the EPNL and other noise measures. Author (ESA)

N82-19958# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Technische Akustik.

COLLECTION AND EVALUATION OF PROPELLER AIRCRAFT NOISE CERTIFICATION DATA

Manfred Ahlswede and Klaus Peter Anders Aug. 1981 87 p refs In GERMAN; ENGLISH summary
(DFVLR-Mitt-81-20) Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 25,20

More than 300 individual noise certification levels were measured for propeller driven airplanes up to 5700 kg takeoff weight and for powered gliders in accordance with the rules and regulations as set forth in International Civil Aviation Organization Annex 16. Information on the airplanes, the engines and the propellers is provided as well as on the prevailing meteorological parameters and the operational parameters together with acoustic data. Of the latter, the measured

A-weighted levels with their 90% confidence limit are listed, the performance correction is given and the certification level as well as the noise-limit are provided. Data are evaluated by plotting the measured A-weighted levels versus the helical blade tip Mach number. Author (ESA)

N82-20128*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

GLOBAL POSITIONING SYSTEM TIMING RECEIVERS IN THE DSN

P. A. Clements *In its* The Telecommun. and Data Acquisition Rept. 15 Feb. 1982 p 90-99 refs

Avail: NTIS HC A07/MF A01 CSCL 17G

The system (GPS) is a worldwide navigation system using a constellation of Earth satellites with onboard clocks. The GPS is also usable to transfer time and frequency. Preliminary tests with the breadboard receiver at NBS produced precision in time and frequency transfer between the United States Naval Observatory (USNO) and NBS. JPL's plans to install receivers in the DSN to demonstrate their ability to transfer time and frequency within the DSN and between the DSN and outside agencies are discussed. T.M.

International Conference on Numerical Methods in Fluid Dynamics, 7th, Stanford University, Stanford and Moffett Field, CA, June 23-27, 1980, Proceedings A82-24426

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Israel Annual Conference on Aviation and Astronautics, 23rd, Tel Aviv and Haifa, Israel, February 11, 12, 1981, Collection of Papers A82-23426

Welding technology for the aerospace industry; Proceedings of the Conference, Las Vegas, NV, October 7, 8, 1980 A82-23751

Conference on Aerospace Transparencies, London, England, September 8-10, 1980, Proceedings A82-24301

Managing computer aided design; Proceedings of the Conference, London, England, November 19, 1980 A82-24371

Aircraft electrical power systems; Proceedings of the Aerospace Congress and Exposition, Anaheim, CA, October 5-8, 1981 [SAE SP-500] A82-24376

International Conference on Numerical Methods in Fluid Dynamics, 7th, Stanford University, Stanford and Moffett Field, CA, June 23-27, 1980, Proceedings A82-24426

Institute of Navigation, Annual Meeting, 37th, U.S. Naval Academy, Annapolis, MD, June 9-11, 1981, Proceedings A82-24643

Aerodynamic Testing Conference, 12th, Williamsburg, VA, March 22-24, 1982, Collection of Technical Papers A82-24651

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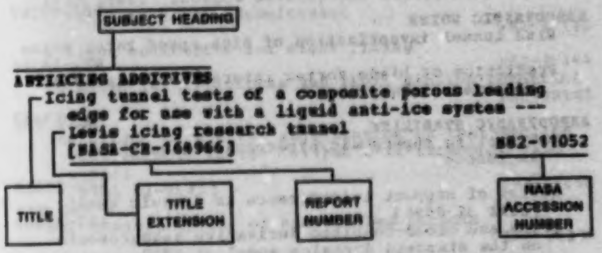

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Report of the Air Traffic Forecasting Working Party, 1981 N82-19195

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- Aeronautical Research Laboratories Structures Division [AD-A109049] N82-19161
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- Utilization of radio equipment at airports and on airways --- Russian book A82-22407
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- Noise measurements on the helicopter BK 117 design. Weighted noise levels and influence of airspeed [DFVLR-MITT-81-18] N82-19957

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[NASA-TM-83307] N82-19132
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  NASA/HAA Advanced Rotorcraft Technology and Tilt Rotor Workshops. Volume 1: Executive Summary [NASA-TM-84149] N82-19170
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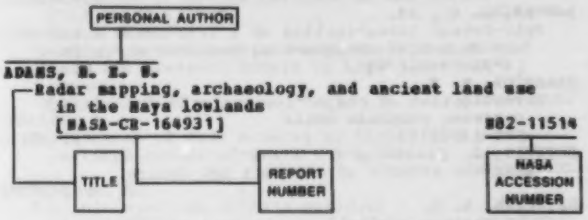

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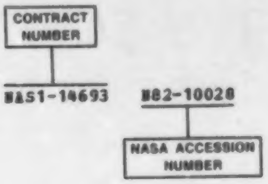

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 382 reports, journal articles, and other documents originally announced in June 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

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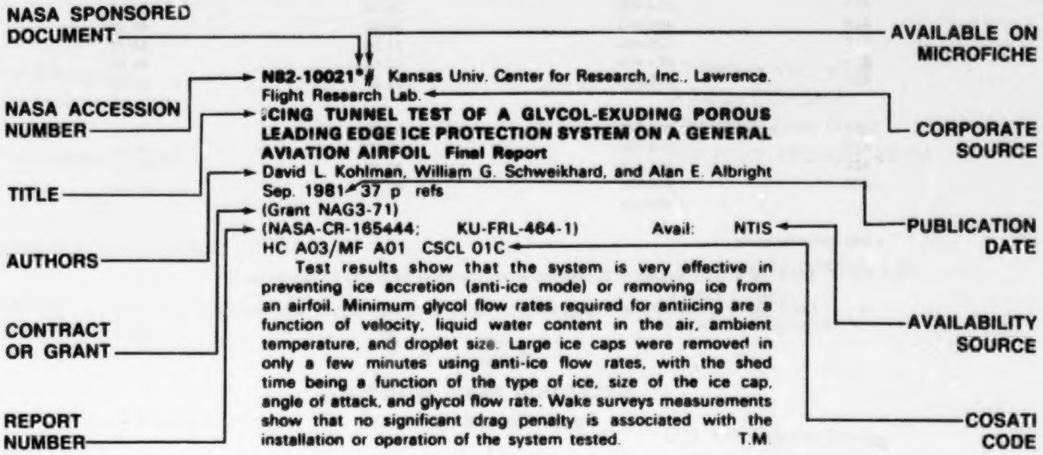

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.

ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report

David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
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Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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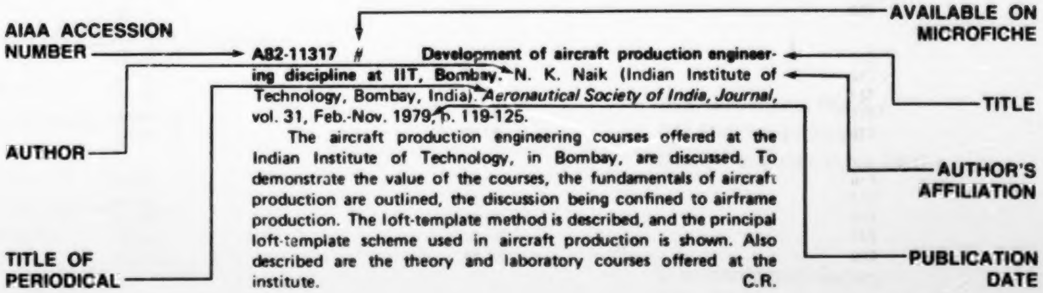

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

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A82-25560 **Introduction to the principles of fracture mechanics (Einführung in die Grundlagen der Bruchmechanik).** W. Dander (Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH, Eggenstein-Leopoldshafen, West Germany). *Zeitschrift für Werkstofftechnik*, vol. 13, Feb. 1982, p. 69-76. In German.

The employment of fracture mechanics makes it possible to obtain vital information concerning the operational life of components of rotor and aircraft structures even in cases in which such information cannot be provided in connection with conventional design technology. Basic questions regarding the origin of cracks in material are discussed, taking into account the strength of solid bodies with ideal elastic characteristics, elementary processes leading to crack formation, and aspects of fracture description. Linear-elastic fracture mechanics is considered along with an energy criterion with respect to crack growth, the crack opening displacement, and the J integral method. Attention is given to basic fracture modes, the fracture mechanical equation and specimen configuration used to determine fracture, and the application of fracture mechanics methodology. G.R.

A82-25577 **Integration of multi-sensor navigation data using optimal estimation techniques.** D. B. Reid, W. S. Gesing, B. N. McWilliam (Philip A. Lapp, Ltd., Toronto, Canada), and J. E. Smyth (Canada Center For Remote Sensing, Ottawa, Canada). In: Conference on Decision and Control, 19th, and Symposium on Adaptive Processes, Albuquerque, NM, December 10-12, 1980, Proceedings. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 584, 585. 6 refs.

Optimal filtering and smoothing algorithms are used to obtain precise aircraft position, velocity and attitude information for remote sensing applications by postflight processing of navigation data collected by several sensors. The data from an Inertial Navigation System (INS) is differenced with data obtained from other sensors which may include photogrammetric resections, a microwave ranging system, a barometric altimeter, a radar altimeter, a laser radar, a VLF/OMEGA navigation system and doppler radar to construct error measurements. The measurements are prefiltered to compress the data and are then processed through a Kalman filter to produce estimates of the time-correlated sensor errors. The filtered error estimates are smoothed by processing backwards in time and used to correct the INS data. The track recovery program uses the UDU/T/ covariance factorized form of the filter algorithm and is capable of processing data from any subset of sensors. The residual errors observed in processing real data collected in a number of field tests are less than 1 meter in position and less than 0.03 degrees in attitude. (Author)

A82-25673 **Von Karman and VKI - The first 25 years.** J. J. Ginoux (Institut Von Karman de Dynamique des Fluides, Rhode-Saint-Genèse; Bruxelles, Université Libre, Brussels, Belgium). *Zeitschrift für Flugwissenschaften und Weltraumforschung*, vol. 6, Jan.-Feb. 1982, p. 27-34.

The Von Karman Institute (VKI) was established in October 1956 in the buildings of the aeronautical laboratory of the Belgian Civil Aviation Authority. The history of the laboratory goes back to 1922. The early history of the laboratory is considered, taking into account pioneering work on helicopters carried out between 1930 and 1940, the modernization of aerodynamic testing facilities after World War II, and von Karman's idea to use the laboratory for training students and research workers of the NATO countries in experimental techniques. A description is given of the approaches used to implement von Karman's idea, giving attention to the development of the VKI into the first truly international aerodynamics school. G.R.

A82-25771 **Some thoughts on design optimization of transport helicopters.** W. Z. Stepniewski and L. H. Sloan. *Vertica*, vol. 6, no. 1, 1982, p. 1-17. 12 refs.

A decrease in the total helicopter operating cost per revenue seat-nautical mile C sub rsm can be achieved by reducing total yearly expenditure for helicopter operation and by increasing annual work time, work speed, and number of revenue seats. Design improvements can lessen maintenance ground time. The most important aspect of design optimization with respect to the fuel-cost share in C sub rsm is the assurance of high gross weight to equivalent drag ratio values at the highest possible flying speeds, with lowest possible effect on aircraft purchase and maintenance costs. Among the factors influencing purchase cost are sharing of production costs, technical and organizational level of production facilities, and labor costs. In designing the power plant, maximization efforts should center around hovering and/or vertical climb aspects. Here disk loading appears to be the strongest design parameter. Finally, gains linked to structural weight increases are modest, although gains are higher when fuel costs decrease. C.D.

A82-25772 * **Model helicopter rotor low frequency broadband noise.** N. G. Humbad and W. L. Harris (MIT, Cambridge, MA). *Vertica*, vol. 6, no. 1, 1982, p. 19-35. 19 refs. Grant No. NsG-1583.

The results of an experimental investigation of low frequency broadband noise (LFBN) radiated from model helicopter rotors are presented. The results up to tip Mach number of 0.50 suggest that the peak sound pressure level (SPL) of LFBN appears to follow tip Mach number to a fourth power law and rms velocity of turbulence to a second power law. The experimental results on the effect of tip speed and advance ratio on the peak SPL of LFBN can be explained on the basis of a simple scaling law. However, the experimental results on the effect of blade loading on the peak SPL of LFBN is still not clearly understood. A simple peak SPL scaling law for noise from a helicopter in forward flight encountering a sinusoidal gust is also developed. The trends predicted by the scaling law with the experimental results are found satisfactory for the cases of variation of the peak SPL of LFBN with tip speed and advance ratio. C.D.

A82-25773 **Sensitivity of helicopter aeromechanical stability to dynamic inflow.** G. H. Gaonkar, A. K. Mitra, T. S. R. Reddy (Indian Institute of Science, Bangalore, India), and D. A. Peters (Washington University, St. Louis, MO). *Vertica*, vol. 6, no. 1, 1982, p. 59-75. 14 refs. NSF Grant No. CME-79-08304.

Since aeromechanical instability or 'resonance' of nonarticulated helicopters generally involves low-frequency flap and lead-lag regressing modes as well as a coupled rotor-body pitch or roll mode, it is expected to be appreciably influenced by dynamic inflow. Therefore, a resonance analysis in hover is presented with four objectives concerning (1) the effect of dynamic inflow on air and ground resonance, (2) the adequacy of the equivalent Lock number and drag coefficient to account for the effect, (3) the possible improvement in correlation with recent experimental data, with the inclusion of inflow and (4) a better understanding of the effect of rotor parameters on the resonance phenomena with dynamic inflow.

Present hazardous weather forecasts are reviewed, along with product generation and information dissemination methods, and system improvements for the 0-2 hr forecast (nowcast) are investigated. The problem of actually detecting or projecting hazardous weather conditions from sensor readings or computer-based cause and effect inferences is regarded as secondary to ensuring that the actual information reaches pilots, air traffic controllers, and aviation meteorologists. Current data gathering systems include rawinsondes, surface networks, weather satellites, and dedicated weather radar. Although subjective assessments of the combined data picture are possible, it is noted that en route weather information is lacking, although partially supplanted by pilot reports of threatening conditions. A high speed national network of nowcasts is being constructed which will provide real time combined weather information available to pilots and covering temporally short hazardous weather. M.S.K.

A82-27083 * # **Numerical solution of Space Shuttle Orbiter flow field.** E. Venkatapathy, J. C. Tannehill (Iowa State University of Science and Technology, Ames, IA), and J. V. Rakich (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0028.* 17 p. 35 refs. Research supported by the Iowa State University of Science and Technology; Grant No. NGR-16-002-038.

The supersonic, viscous laminar flow around the Space Shuttle Orbiter forebody has been computed with a parabolized Navier-Stokes code using a generalized coordinate transformation. The initial solution for the nose part of the Orbiter geometry was obtained with a three-dimensional time-dependent Navier-Stokes solver. It was necessary to employ a wind axis oriented coordinate system to obtain the initial solution with the time-dependent code. The generalized PNS technique used in this study allows the solution to be marched from the given initial data surface to any desired surface downstream. A grid point clustering scheme was employed to accurately describe the body shape by clustering points at the wing tip and at the wing body juncture. The computed heat transfer coefficients, pressure coefficients, and shock shapes are compared with the available experimental data for 0 degrees and 30 degrees angle of attack. (Author)

A82-27086 # **Experimental study of the flowfield of an airfoil with deflected spoiler.** B. G. McLachlan, K. Karamcheti (Stanford University, Stanford, CA), and F. van Leynseele (Boeing Commercial Airplane Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0126.* 9 p. 14 refs. Research supported by the Boeing Commercial Airplane Co.

An experimental study of the flow field generated by a typical two-dimensional airfoil-spoiler configuration is presented, in which subsonic tests ascertained the effects of varying such parameters as spoiler deflection and angle of attack, at Reynolds numbers of 280,000 and 520,000. Data gathered on static surface pressures, wake and boundary layer mean velocities and vortex shedding characteristics show that the spoiler wake is dominated by vortex shedding over a wide range of conditions, in agreement with other bluff body investigations of Strouhal number and base pressure coefficient. O.C.

A82-27087 # **An experimental and analytical study of mixing flow of turbofan engine exhaust through circular and 2-dimensional mixer/nozzle.** F. P. Saheli, R. L. Hanson, and B. F. Kerkham (Boeing Aerospace Co., Seattle, WA). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0130.* 9 p.

The results of a test program conducted to obtain plume temperature, nozzle wall temperature and nozzle flow coefficient data for two-dimensional nozzles, with and without forced mixing, indicate that an 18-lobe mixer achieved nearly complete mixing. Analytical predictions of exit temperature profiles and wall temperatures generated by a three-dimensional viscous flow computer program agreed well with test data for cases with and without the mixer. Although such specific features as the exact location of the peak temperature, in the case of mixer/nozzle simulation, were not predicted, major trends of total temperature distribution were simulated. It is shown by a comparison of measurements of two-dimensional nozzle thrust and flow coefficients with those of a circular nozzle, that the mixing efficiency gain due to the addition of an 18-lobe mixer is greater for the axisymmetric nozzle. (Author)

A82-27093 # **Heavy rain penalties for a flight simulator.** P. Haines and J. K. Luers (Dayton, University, Dayton, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0213.* 19 p. 7 refs.

A set of curves, representing lift and drag performance degradation of aircraft due to airfoil surface roughness effects under heavy rain, is established for application to flight simulators. Experimental data was analyzed to quantify the lift and drag increments of single- and multi-element airfoils, both for cases where distributed roughness elements uniformly cover the entire wing and where roughness elements begin at various locations aft of the leading edge. Simulated airfoil roughness is then related to rainfall rates and frost parameters, so that the performance penalty induced by a given environmental condition can be estimated. Flight simulator test results which include roughness effects may lead to revised procedures for aircraft takeoff, landing, and maneuvers under severe environmental conditions. O.C.

A82-27098 * # **Mathematical modeling of ice accretion on airfoils.** C. D. MacArthur, J. L. Keller, and J. K. Luers (Dayton, University, Dayton, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0284.* 18 p. 8 refs. Grant No. NAG3-65.

The progress toward development of a computer model suitable for predicting icing behavior on airfoils over a wide range of environmental conditions and airfoils shapes is reported. The LEWICE program was formulated to solve a set of equations which describe the physical processes which occur during accretion of ice on an airfoil, including heat transfer in a time dependent mode, with the restriction that the flow must be describable by a two-dimensional flow code. Input data comprises the cloud liquid water content, mean droplet diameter, ambient air temperature, air velocity, and relative humidity. A potential flowfield around the airfoil is calculated, along with the droplet trajectories within the flowfield, followed by local values of water droplet collection efficiency at the impact points. Both glaze and rime ice conditions are reproduced, and comparisons with test results on icing of circular cylinders showed good agreement with the physical situation. M.S.K.

A82-27109 **Quantitative interpretation of recirculated flow visualization by the analysis of video pictures.** P. Calvet, A. Giovannini, P. Hebrard, and G. Toulouse (ONERA, Département de Mécanique et Energétique des Systèmes, Toulouse, France). In: Flow visualization II; Proceedings of the Second International Symposium, Bochum, West Germany, September 9-12, 1980.
Washington, DC, Hemisphere Publishing Corp., 1982, p. 63-68.

The development of a television monitoring system for use in flow visualization studies in a hydrodynamic tunnel constructed at ONERA-CERT is detailed. In order to obtain quantitative results without recourse to large computer storage requirements, electronic coupling was devised between a video camera, microcomputer, and plotter for use in colorimetric and trajectographic experiments. Real-time information of local and time-averaged data was made available of dye tracers brightness or residence time. The wiring possesses four circuits: a reference window, a video experimental window for spatial analysis, scan line analysis for changes of dark-to-light, and a trajectographic circuit connected to a camera and a microcomputer in order to fix a particle position in Cartesian coordinates. Successive images are coded into computer memory for retrieval and analysis. M.S.K.

A82-27114 **More than meets the eye - The oil dot technique.** E. Atraghji (National Aeronautical Establishment, Ottawa, Canada). In: Flow visualization II; Proceedings of the Second International Symposium, Bochum, West Germany, September 9-12, 1980. Washington, DC, Hemisphere Publishing Corp., 1982, p. 619-628. 7 refs.

A numerical model is developed to gain quantitative data on the surface shear stress distribution on an object studied by means of the oil dot technique. Consideration is given to an idealized dot set in motion by a constant shear stress and leaving a streak which in time is described by equations of motion. Viscosity is accounted for by means of a pi theorem. Examples are provided for the flow over an ellipsoid of revolution using lamp black suspended in Blazers oil L, with simultaneous pressure measurements by Preston and pitot tubes. A second trial was performed using lamp black and glycerine on a flat glass plate in a flow of varying Mach number. A nonlinear behavior of the shear stress in relation to the streak length was observed in the first trial, and a proportionality between the length and the shear stress in the second. It is concluded that glycerine is a more suitable streak fluid than the lamp black, and that small magnetic disks can be tried with suitably magnetic bodies. M.S.K.

A82-27126 **Fibrous composites in structural design.** Edited by E. M. Lenoe, D. W. Oplinger, and J. J. Burke (U.S. Army, Army Materials and Mechanics Research Center, Watertown, MA). New York, Plenum Press, 1980. 883 p. $65.

Developments related to aircraft structures are discussed, taking into account composite aircraft structures, composite wing substructure technology on the AV-8B advanced aircraft, a preliminary design development AV-8B forward fuselage composite structure, a wing fuselage critical component development program, and the development of a preloaded hybrid advanced composite wing pivot fairing. Other topics considered are related to missile and space applications, crashworthiness, impact damage, postbuckling, dynamics response, and special design considerations. Attention is also given to laminate plate theories, edge effects, flaw growth, helicopter applications, composite joints, a reliability/durability analysis, environmental effects, the development of an advanced composite hydrofoil control flap, and advancements in composite material flywheels. G.R.

A82-27127 * **Composite aircraft structures.** L. F. Vosteen (NASA, Langley Research Center, Hampton, VA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 7-24. 6 refs.

In late 1975, the Aircraft Energy Efficiency (ACEE) program was initiated by NASA in order to accelerate the development of selected technologies which showed promise for substantial improvements in the fuel efficiency of commercial transport aircraft. A description is presented of the status of the composite structure development programs which form one of the six sections of the ACEE program. Six aircraft components are currently being developed under NASA contract by three major transport manufacturers. The components include the upper aft rudder of the Douglas DC-10, the inboard ailerons of the Lockheed L-1011, the elevators of the Boeing 727, the vertical stabilizers for the Lockheed L-1011 and Douglas DC-10, and the horizontal stabilizers of the Boeing 737. It is found that the composite components show a high potential for achieving cost comparability with the metal parts they are designed to replace. G.R.

A82-27128 **Composite wing substructure technology on the AV-8B advanced aircraft.** M. L. Huttrop (McDonnell Aircraft Co., St. Louis, MO). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 25-40.

Design improvements to the AV-8B V/STOL aircraft to increase the payload-radius capability include a new wing design. New wing design features are related to an increased aspect ratio for better cruise performance, an increased thickness ratio for lighter structure and increased fuel volume, additional store stations, maneuvering flaps with positive circulation, increased aileron and flap travel, and composite structure for reduced weight and unconstrained optimization of the aerodynamic shape of the advanced supercritical airfoil. The wing has one-piece graphite/epoxy skins and a multi-spar substructure with graphite/epoxy sinewave webs. Attention is given to a wing description, aspects of substructure design, sinewave configuration, tooling, design details, corrosion prevention, and nondestructive testing. G.R.

A82-27129 **Preliminary design development AV-8B forward fuselage composite structure.** J. C. Watson (McDonnell Aircraft Co., St. Louis, MO). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 41-61.

The AV-8B is a second generation V/STOL aircraft which derives its superior performance from selective improvements to the AV-8A. It has twice the payload radius capability of the AV-8A, improved weapon delivery accuracy, and increased operational readiness. These improvements are being validated by flight demonstrations with two YAV-8B prototype aircraft. The AV-8B combines U.S. V/STOL technology with the proven vectored thrust concept. A new, larger wing has a higher aspect ratio and a supercritical airfoil. The major structural elements of the wing and forward fuselage are of composite materials. The forward fuselage is a conventional single-seat structure with the multiframe and stringer construction. Attention is given to details concerning the composite structure, the repairability of the composite design, the influence of trade studies on the design, a comparison of weights and costs, and fuselage fabrication techniques. G.R.

A82-27130 **Wing/fuselage critical component development program.** R. W. Walter, R. R. June, J. E. Mooney, and R. A. Hamm (Boeing Co., Seattle, WA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 63-93. Contract No. F33615-77-C-5228.

The employment of advanced composites in modern high performance aircraft has been generally limited to relatively uncomplicated structure and based on substitution design or replacement approaches. The logical and orderly expansion of the use of advanced composites in more complex primary structure will result in additional cost and weight saving. Potential lower acquisition costs can be achieved due to improved low cost manufacturing approaches. The relative insensitivity of advanced composites to fatigue damage can result in longer service life and significantly lower life cycle costs. A summary is presented of the results obtained by an American aircraft manufacturer in an Air-Force sponsored Phase I study program. Attention is given to a structural configuration definition, preliminary structural design and trade studies, and aspects of structural design development. G.R.

A82-27131 **Development of a preloaded hybrid advanced composite wing pivot fairing.** D. O. Lowe, J. F. Willis, and W. L. Zirbes (Rockwell International Corp., Los Angeles, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 95-102.

A description is presented of the results of the advanced composite developmental work performed in support of the B-1 Bomber Wing Fairing Design Improvement Program under Air Force contract. This study was performed by an American aerospace company during the 12-month period from August 1976 to August 1977. The wing fairing system for the B-1 bomber consists of a fixed fairing for fuselage/fairing moldline transition, an aft movable fairing for nacelle-to-underwing aerodynamics, aft overwing transition panels, and the forward preloaded wing pivot fairing. Attention is given to the redesign of the preloaded pivot fairings. An advanced composite hybrid glass/epoxy design was developed which indicated a potential weight savings of 47 percent of approximately 900 pounds over the solid fiberglass baseline design used on B-1 RDT and E aircraft 1 through 4. G.R.

A82-27132 **Design concepts for composite fuselage structure.** C. R. Foreman (Vought Corp., Dallas, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 103-123.

Investigations have been conducted concerning the development of vertical lift concepts in support of the Navy's future generation of V/STOL aircraft. These aircraft will operate from ships considerably smaller and less expensive than current supercarriers. Studies to date have been directed toward two basic types of aircraft, including the subsonic ASW/AEW 'Type A' aircraft, and the Mach 2 fighter 'Type B' aircraft. Composite fuselage development work conducted during the past two years has provided valuable design information. It was found that significant weight savings for use of composite materials versus conventional metal construction in fuselage shell structure can be obtained at low loading intensities, in the minimum gage range. Low fabrication cost design concepts for large, stiffened-panel type fuselage shell structure have been generated, and preliminary testing has been conducted. G.R.

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STAR ENTRIES

N82-20139# Air Force Academy, Colo. Dept. of Aeronautics.
AIR FORCE ACADEMY AERONAUTICS DIGEST FALL/SUMMER 1980 Final Report
A. M. Higgins, ed., E. J. Jumper, ed., J. M. Kempt, ed., and B. J. Gregory, ed. May 1981 149 p refs
(AD-A108338; USAFA-TR-81-4) Avail: NTIS HC A07/MF A01 CSCL 20/4

The digest includes technical papers in the specific areas of aerodynamics, propulsion, experimental instrumentation, biomechanics, engineering education, and aeronautical history. Canard wake measurements, the relation between camber and zero-lift angle of attack, and the early history of the jet engine were examined. T.M.

N82-20140# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
JOURNAL OF AERONAUTICS AND ASTRONOMY
11 Dec. 1981 183 p refs Transl. into ENGLISH from Acta Aeron. et Astronautica Sinika (China), v. 1, no. 1, 1980 104 p
(AD-A109681; FTD-ID(RS)T-0722-81) Avail: NTIS HC A09/MF A01 CSCL 20/4

Articles dealing with aerodynamics and astronomy are presented. Slender wings, axisymmetric bodies, attitude control systems and digital filters are discussed. R.J.F.

N82-20142 Ohio State Univ., Columbus.
AEROELASTIC CHARACTERISTICS OF A MISTUNED BLADED-DISC ASSEMBLY Ph.D. Thesis
Robert Evans Kielb 1981 206 p
Avail: Univ. Microfilms Order No. 8129037

The aeroelastic characteristics of mistuned bladed disc assemblies are studied by analytically modeling the bladed disc and its environment and using these models to conduct parametric studies. These studies have concentrated on the effect of mistuning on the system stability and, to a lesser extent, on the aeroelastic response. Aerodynamic coupling between the blades is investigated. Each blade is modeled as a two degree of freedom oscillator in which the airfoil is permitted to have bending (plunging) and torsional (pitching) motions which are inertially coupled. The disc is focused on and a technique is presented for calculating the free vibration frequencies and mode shapes of a rotating disc with variable thickness and temperature. The resulting model is used to study the dependency of disc modal frequency on the nodal diameter of the mode. Dissert. Abstr.

N82-20143*# McDonnell Aircraft Co., St. Louis, Mo.
TESTS AND ANALYSIS OF A VENTED D THRUST DEFLECTING NOZZLE ON A TURBOFAN ENGINE Final Report, Mar. 1980 - Mar. 1982
E. W. Rosberg Mar. 1982 78 p refs
(Contract NAS2-10564)
(NASA-CR-166279; NAS 1.26:166279; MDC-IR0280) Avail: NTIS HC A05/MF A01 CSCL 21E

The objectives were to: obtain nozzle performance characteristics in and out of ground effects; demonstrate the compatibility of the nozzle with a turbofan engine; obtain pressure and temperature distributions on the surface of the D vented nozzle; and establish a correlation of the nozzle performance between small scale and large scale models. The test nozzle was a boilerplate model of the MCAIR D vented nozzle configured for operation with a General Electric YTF-34-F5 turbofan engine. The nozzle was configured to provide: a thrust vectoring range of 0 to 115 deg; a yaw vectoring range of 0 to 10 deg; variable nozzle area control; and variable spacing between the core exit and nozzle entrance station. Compatibility between the YTF-34-T5 turbofan engine and the D vented nozzle was demonstrated. Velocity coefficients of 0.96 and greater were obtained for 90 deg of thrust vectoring. The nozzle walls remained cool during all test conditions. T.M.

N82-20148*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRELIMINARY INVESTIGATION OF EFFECTS OF HEAVY RAIN ON THE PERFORMANCE OF AIRCRAFT
Otto W. K. Lee Feb. 1982 16 p refs
(NASA-TM-83272; NAS 1.15:83272) Avail: NTIS HC A02/MF A01 CSCL 01C

A guideline was defined for the analysis of flight data to determine the effects of rain on the aerodynamic performance of an aircraft. It distinguishes and separates the effects of horizontal wind shears, downdrafts, gusts at the phugoid frequency, and rain based on various aerodynamic parameters. Flight data from NASA LaRC's TCV B-737 were inconclusive because precipitation rates encountered probably were not high enough. However, the guideline seemed to be valid and can be used on further flight data evaluations. Difficulties in this type of data analysis are discussed. Other indirect influences of rain on the degradation of airplane performance are also considered. Author

N82-20149*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LAMINAR FLOW CONTROL. THE RESEARCH AND TECHNOLOGY STUDIES 1981
Dal V. Maddalon, ed. Mar. 1982 135 p refs Proceedings of Conf. held at Dryden Flight Research Center, Edwards, Calif., 17-18 Sep. 1981
(NASA-CP-2218; NAS 1.55:2218; L-15084) Avail: NTIS HC A07/MF A01 CSCL 01A

Laminar flow airfoil design and construction, boundary layer control characteristics, and construction materials and methods are discussed. For individual titles, see N82-20150 through N82-20155.

N82-20150*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NASA LANGLEY LAMINAR FLOW CONTROL AIRFOIL EXPERIMENT
W. D. Harvey and J. D. Pride *In its* Laminar Flow Control Mar. 1982 p 1-42 refs

Avail: NTIS HC A07/MF A01 CSCL 01A

The design and construction of an advanced swept supercritical airfoil for commercial aircraft to be tested in a transonic wind tunnel is described. The swept LFC airfoil was designed for a given thickness ratio and lift coefficient, with emphasis placed on high critical Mach number with shock-free flow. It is compatible with satisfactory low speed and buffeting characteristics and minimizing the suction laminarization. Further emphasis was placed on achieving shock-free flow over a wide range of off-design conditions including trailing edge flap control. The requirements and design of the suction system and modifications to the Langley 8 foot transonic pressure tunnel is briefly described. Contouring of nonporous test section walls for free air simulation and flow quality improvements is included. J.D.H.

N82-20151*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATUS OF NASA ADVANCED LFC AIRFOIL HIGH-LIFT STUDY
Zachary T. Applin *In its* Laminar Flow Control Mar. 1982 p 43-62 refs
Avail: NTIS HC A07/MF A01 CSCL 01A

The design of a high lift system for the NASA advanced LFC airfoil designed by Pfenninger is described. The high lift system consists of both leading and trailing edge flaps. A 3 meter semispan, 1 meter chord wing model using the above airfoil and high lift system is under construction and will be tested in the NASA Langley 4 by 7 meter tunnel. This model will have two separate full span leading edge flaps (0.10c and 0.12c) and one full span trailing edge flap (0.25c). The performance of this high lift system was predicted by the NASA two dimensional viscous multicomponent airfoil program. This program was also used to predict the characteristics of the LFC airfoils developed by the Douglas Aircraft Company and Lockheed-Georgia Aircraft Company. J.D.H.

N82-20152*# Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Sciences and Mechanics.

activities will proceed from a common reference point based upon agreement among all related program organizations. The distribution of flow management functions among the various ATC facilities and the related interfacility communications requirements are central issues addressed in this report. A road map projection of the IFM near term evolution through the late 1980s and remaining open issues related to the IFM development are also presented. Author (GRA)

N82-21173# Federal Aviation Administration, Atlantic City, N.J. Technical Center.

JOINT US/USSR MODE S COMPATIBILITY TEST PROGRAM, VOLUME 1 Final Report, 5 Oct. - 30 Oct. 1981

Rodney Guishard and Anatoly Bolshev Oct. 1981 36 p refs 2 Vol.

(FAA Proj. 034-241-510)

(PB82-126616; DOT/FAA-CT-82-16-Vol-1) Avail: NTIS HC A03/MF A01 CSCL 17G

The compatibility of a U.S.S.R. designed transponder with the U.S. Mode S system was investigated. A U.S. transponder was included in these tests for convenient comparison of results. Both bench tests and flight tests were conducted to ascertain compatibility to the U.S. Discrete Address Beacon System (DABS) National Standard of 1978. Radial and orbital flight profiles were used to gather statistical data to draw conclusions about the transponder's performance in conjunction with the Mode S system. Both the methods of conducting these tests and the results obtained are described. GRA

N82-21174# Federal Aviation Administration, Atlantic City, N.J. Technical Center.

JOINT US/USSR MODE S COMPATIBILITY TEST PROGRAM, VOLUME 2 Final Report, 5 Oct.- 30 Oct. 1981

Rodney Guishard and Anatoly Bolshev Oct. 1981 143 p 2 Vol.

(FAA Proj. 034-241-510)

(PB82-126624; DOT/FAA-CT-82-16-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 17G

Data collected during the compatibility tests are presented. These tests included a U.S. transponder for convenience of comparison. It is concluded that the U.S.S.R. mode S transponder operated successfully and is compatible with the U.S. mode S system. Performance of both the U.S. and U.S.S.R. transponders were comparable. T.M.

N82-21175*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

AIRCRAFT INTERROGATION AND DISPLAY SYSTEM: A GROUND SUPPORT EQUIPMENT FOR DIGITAL FLIGHT SYSTEMS

Richard D. Glover Apr. 1982 46 p refs

(NASA-TM-81370; NAS 1.15:81370) Avail: NTIS HC A03/MF A01 CSCL 01D

A microprocessor-based general purpose ground support equipment for electronic systems was developed. The hardware and software are designed to permit diverse applications in support of aircraft flight systems and simulation facilities. The implementation of the hardware, the structure of the software, describes the application of the system to an ongoing research aircraft project are described. T.M.

N82-21176# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

GENERIC TEST BED (GTB) AIRCRAFT Final Report, 1 May 1980 - 1 Oct. 1981

Donald R. Chislaghi, Dennis W. Jarvi, and Steven R. Markman Dec. 1981 61 p refs

(AD-A110335; ASD-TR-81-5036) Avail: NTIS HC A04/MF A01 CSCL 01/3

The Night Attack Workload Steering Group (NAWSG) was requested by HQ AFSC/SD to investigate the need for a Generic Test Bed aircraft and to identify potential candidate aircraft. The team learned a need existed for an aircraft that could perform near the night attack envelope. The aircraft is needed to test, under realistic conditions, both the avionics and their effect on pilot crew workload. The team also identified several potential candidate aircraft that had sufficient cockpit space, volume, cooling and power to permit it to support this mission. Author (GRA)

N82-21177# Army Aviation Engineering Flight Activity, Edwards AFB, Calif. Directorate for Development and Qualification.

PRELIMINARY AIRWORTHINESS EVALUATION OF THE UH-1H WITH HOT METAL PLUS PLUME INFRARED SUPPRESSOR AND INFRARED JAMMER Final Report, 16 Jan. - 18 May 1981

Bartholomew D. Picasso, III, John D. Ottomeyer, Loran A. Haworth, and Richard Vincent Jun. 1981 87 p refs

(AD-A110213; USAAEFA-80-06) Avail: NTIS HC A05/MF A01 CSCL 01/2

The Preliminary Airworthiness Evaluation (PAE) of the UH-1H, with the Infrared (IR) Suppressor and AN/ALQ-144 IR Jammer installed, was conducted using a JUH-1H. The initial design cused a degradation in directional stability. The installation was redesigned to reduce the airflow disturbance over the tail rotor and vertical stabilizer. This evaluation was conducted in two phases. Phase 1 was a comparative evaluation of handling qualities of the UH-1H in both the standard and IR suppressor configurations. Phase 2 was primarily a pressure and temperature survey of the IR suppressor configuration. The handling qualities of the UH-1H helicopter were essentially unchanged by the IR suppressor and IR jammer installation tested. The tail boom surface temperatures were higher for the initial design. The metal to metal contact between the engine exhaust ejector and the IR suppressor inner core support struts,was identified. Three shortcomings were also identified. GRA

N82-21178# Naval Air Test Center, Patuxent River, Md. Systems Engineering Test Directorate.

ALQ-164 POD/AV-8C ENVIRONMENTAL EVALUATION FLIGHT TEST

Lawrence J. Mertaugh 11 Dec. 1981 152 p

(AD-A110198; NATC-TM-81-109-SY) Avail: NTIS HC A08/MF A01 CSCL 01/3

This report provides the test results of a flight test program conducted to evaluate the environmental conditions to which the ALQ-164 pod is exposed when carried on the AV-8C aircraft. Descriptions are provided of the test program, test equipment, instrumentation, and methods of analysis. The test results include cooling-air mass flow and temperature, vibration levels measured on the pod structure and on the isolator mounted equipment support structure, and pod skin temperature. Test conditions include steady-state conditions throughout the available pod/aircraft flight envelope as well as various vertical takeoff and landing, short takeoff and landing and gun fire operations. Author (GRA)

N82-21179# Systems Technology, Inc., Hawthorne, Calif.

OPTIMAL TERRAIN-FOLLOWING FEEDBACK CONTROL FOR ADVANCED CRUISE MISSILES Final Report

Richard F. Whitbeck and Julian Wolkovitch (Aeronautical Consultant Associates) Jan. 1982 48 p refs

(Contract N00014-79-C-0657)

(AD-A110286) Avail: NTIS HC A03/MF A01 CSCL 16/4

A cruise missile is a vehicle that spends the major portion of its flight at essentially constant altitude and speed. Some cruise missiles are flown at very low altitudes in order to avoid detection. The terrain-following capabilities of such a missile and its guidance system are of importance. It is desirable that the missile should follow closely the contour of the terrain, which may be fixed (Land) or time-varying (ocean waves). A previous study (Ref. 1) demonstrated that optimal control theory could usefully be applied to calculate the best achievable accuracy of terrain-following. Reference 1 showed that, even with an optimal guidance system, terrain-following accuracy was limited by considerations of the cruise missile's inertias, airspeed, and aerodynamic configuration. Author (GRA)

N82-21180# Lockheed-Georgia Co., Marietta.

NUMERICAL AIRCRAFT DESIGN USING 3-D TRANSONIC ANALYSIS WITH OPTIMIZATION. VOLUME 1: EXECUTIVE SUMMARY Final Report, May 1978 - Sep. 1980

A. J. Srokowski, M. E. Lores, and P. Aidala (Grumman Aerospace Corp., Bethpage, N.Y.) Wright-Patterson AFB, Ohio AFWAL Aug. 1981 59 p refs 2 Vol.

(Contract F33615-78-C-3014; AF Proj. 2404)

(AD-A110035; LG81ER0107-Vol-1; AFWAL-TR-81-3091-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 20/4

A detailed summary of the work performed in the Advanced Transonic Technology (ATT) program to incorporate 3-D Transonic computational aerodynamics methods into aircraft design procedures is presented. Existing transonic analysis programs were modified for the design procedure and linked with a numerical optimization program to design wings that are in some sense optimized for a given set of design conditions. The design procedure was validated by applying it in two design case studies. The application of the design procedure in each of these case studies is described in detail. The configurations resulting from these studies were subjected to design verification wind tunnel testing. Comparisons of test data with computed results are presented. GRA

N82-21181# Lockheed-Georgia Co., Marietta.
NUMERICAL AIRCRAFT DESIGN USING 3-D TRANSONIC ANALYSIS WITH OPTIMIZATION, VOLUME 2. PART 1: TRANSPORT DESIGN Final Report, May 1978 - Sep. 1980
A. J. Srokowski, M. E. Lores, R. A. Weed, and P. R. Smith Wright-Patterson AFB, Ohio AFWAL Aug. 1981 187 p refs Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y. 2 Vol.
(Contract F33615-78-C-3014; AF Proj. 2404)
(AD-A110231; LG81ER0107-Vol-2-Pt-1;
AFWAL-TR-81-3091-Vol-Pt-1) Avail: NTIS HC A09/MF A01 CSCL 20/4

The purpose was to develop and validate a new transonic wing design procedure using the numerical optimization technique. The new procedure was used to design both a transport and a fighter configuration. Because the missions and design requirements of a fighter and transport are so different, the design procedure was developed along parallel lines. The results of a transport design case study performed to evaluate the transonic aircraft design procedure developed as part of the Advanced Transonic Technology (ATT) program are presented. A derivative of the C141B aircraft was selected as the design configuration. The design procedure was applied to the baseline configuration and the performance of resulting configuration was then compared to the C141 aircraft. Extensive wind tunnel testing of the design configuration was performed to validate the design procedure. The results of the wind tunnel tests are correlated with computational results generated in the design process. In addition, the evolution of the design procedure and its application in the transport design case study is discussed. GRA

N82-21182# Lockheed-Georgia Co., Marietta.
NUMERICAL AIRCRAFT DESIGN USING 3-D TRANSONIC ANALYSIS WITH OPTIMIZATION, VOLUME 2. PART 2: FIGHTER DESIGN Final Report, May 1978 - Sep. 1980
P. Aidala Wright-Patterson AFB, Ohio AFWAL Aug. 1981 64 p refs Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y.
(Contract F33615-78-C-3014; AF Proj. 2404)
(AD-A110036; LG81ER0107-Vol-2-Pt-2;
AFWAL-TR-81-3091-Vol-2-Pt-2) Avail: NTIS HC A04/MF A01 CSCL 20/4

The results of a fighter design case study performed to evaluate the transonic aircraft design procedure developed as part of the Advanced Transonic Technology (ATT) program are presented. The fighter design is based on the Configuration Design of Advanced Fighters program dual role configuration. Extensive wind tunnel testing of the design configuration was performed to validate the design procedure. The results of the wind tunnel tests are correlated with computational results generated in the design process. The purpose of the ATT program was to develop and validate a new transonic wing design procedure using numerical optimization. The new procedure was used to design both a transport and a fighter configuration. Because the missions and design requirements of a fighter and transport are so different, the design procedure was developed along parallel lines. This is Part 2 of a two-part volume: Part 1 details the transport development, and Part 2 describes the fighter development. There are two other volumes which make up the final report. Volume 1 is an executive summary. It highlights the information that has been presented in detail here. GRA

N82-21183# Lockheed-Georgia Co., Marietta.
NUMERICAL AIRCRAFT DESIGN USING 3-D TRANSONIC ANALYSIS WITH OPTIMIZATION, VOLUME 3. PART 1: USER'S GUIDE TO TRANSPORT DESIGN COMPUTER PROGRAMS Final Report, May 1978 - Sep. 1980
R. A. Weed and A. J. Srokowski Wright-Patterson AFB, Ohio AFWAL Aug. 1981 136 p refs Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y.
(Contract F33615-78-C-3014; AF Proj. 2404)
(AD-A110232; LG81ER0107-Vol-3-Pt-1;
AFWAL-TR-81-3091-Vol-3-Pt-1) Avail: NTIS HC A07/MF A01 CSCL 20/4

This document is the first part of a two part volume of detailed User's Guide for the computer programs of a new transonic wind design procedure. Part 1 presents the User's Guide for the transport design programs produced by Lockheed-Georgia Company and Part 2 presents the User's Guide for the fighter design programs. The purpose of the contract was to develop and validate a new transonic wing design procedure using the numerical optimization technique. The new procedure was used to design both a transport and a fighter configuration. Because the missions and design requirements of a fighter and transport are so different, the design procedure was developed along parallel lines. Lockheed-Georgia Co. developed the transport design procedure, and Grumman Aerospace Corp. developed the fighter design procedures. Users guides for the computer programs used in the transport design case study for the aircraft design procedure developed as part of the Advanced Transonic Technology (ATT) program are presented. These programs include two 3D transonic wing analysis codes linked to a numerical optimizing routine, a two dimensional strip boundary layer program and a wing pylon nacelle interference program. The input data required by each program is described in detail. Samples of the output from each program are presented. Author (GRA)

N82-21184# Lockheed-Georgia Co., Marietta.
NUMERICAL AIRCRAFT DESIGN USING 3-D TRANSONIC ANALYSIS WITH OPTIMIZATION, VOLUME 3. PART 2: USER'S GUIDE TO FIGHTER DESIGN COMPUTER PROGRAM Final Report, May 1978 - Sep. 1980
P. Aidala Wright-Patterson AFB, Ohio AFWAL Aug. 1981 98 p refs Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y.
(Contract F33615-78-C-3014; AF Proj. 2404)
(AD-A110037; LG81ER0107-Vol-3-Pt-2;
AFWAL-TR-81-3091-Vol-3-Pt-2) Avail: NTIS HC A05/MF A01 CSCL 20/4

A User's Guide for the computer code used in the fighter design case study of the Advanced Transonic Technology (ATT) program is presented. The design code includes a 3D transonic wing-body-canard analysis program linked to a numerical optimization routine and a two dimensional strip boundary layer program. The input data required is described in detail and samples of the output are presented. The purpose of the ATT program was to develop and validate a new transonic wing design procedure using the numerical optimization technique. The new procedure was used to design both a transport and a fighter configuration. Because the missions and design requirements of a fighter and transport are so different, the design procedure was developed along parallel lines. Lockheed-Georgia Co. developed the transport design procedure, and Grumman Aerospace Corp. developed the fighter design procedure. This document is the second part of a two-part volume of detailed User's Guides for the computer programs produced by Lockheed-Georgia Company and Grumman Aerospace Corp. of a new transonic wing design procedure. GRA

N82-21185# Messerschmitt-Boelkow G.m.b.H., Munich (West Germany). Unternehmensbereich Drehfluegler.
HELICOPTER VIBRATION CONTROL: A SURVEY
G. Reichert Ottobrunn, West Germany 1 Sep. 1980 31 p refs Presented at 6th European Rotorcraft and Powered Lift Aircraft Forum, Bristol, England, 16-19 Sep. 1980
(MBB-UD-302/80-O) Avail: NTIS HC A03/MF A01

Methods for reducing helicopter vibrations are reviewed including structural optimization of the rotor and the whole helicopter, blade and rotor pendulum absorbers, rotor isolation concepts following the antiresonance principle (nodal isolation), and active isolation devices. Vibration characteristics at various speeds and during maneuvers are summarized. The integration of vibration considerations during design and development are shown, including finite element modeling in the detail design phase. Developments in automatic harmonic blade pitch control utilizing closed loop systems are mentioned. Author (ESA)

N82-2118[illegible]# Messerschmitt-Boelkow G.m.b.H., Munich (West Germany). Unternehmensbereich Drehfluegler.
INVESTIGATIONS OF HELICOPTER STRUCTURAL DYNAMICS AND A COMPARISON WITH GROUND VIBRATION TESTS

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Cold-air performance of a 15.41-cm-tip-diameter axial-flow power turbine with variable-area stator designed for a 75-kW automotive gas turbine engine
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A82-25794 † **Suppression of self-oscillations in open wind tunnels (Podavlenie avtokolebanii v aerodinamicheskikh trubakh s otkrytoi rabochei chast'iu).** M. Iu. Boiarchikova, E. V. Vlasov, A. S. Ginevskii, and A. V. Zosimov. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Jan.-Feb. 1982, p. 126-132. In Russian.

A method of self-oscillation suppression for open wind tunnels is described which is based on the reduction of turbulence in subsonic jets by high-frequency acoustic irradiation. It is shown that regular low-frequency oscillations with characteristic Strouhal numbers Sh = fd/V = 0.2-0.7 (where d is the nozzle diameter, V is the flow velocity on the nozzle section, and f is the characteristic frequency of oscillations in the jet or the frequency of acoustic irradiation) can be significantly reduced by the action on the jet of high-frequency acoustic oscillations, whose characteristic frequency corresponds to Strouhal numbers of 2-5. B.J.

A82-25795 † **Conditions of pulsed starting of supersonic wind tunnel diffusors (Usloviia impul'snogo zapuska sverkhzvukovykh diffuzorov aerodinamicheskikh trub).** V. L. Grigorenko. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Jan.-Feb. 1982, p. 133-141. 14 refs. In Russian.

A quasi-one-dimensional approach in the framework of an ideal gas is used to study the pulsed starting of nonregulated supersonic wind tunnel diffusors. Relations for determining the optimal pulsed-starting conditions are obtained on the basis of (1) the application of the Chisnell hypothesis to a reversed shock wave propagating along a nonuniform flow; (2) allowance for the interaction of this wave with disturbances reflected from the diffusor; and (3) the assumption of quasi-steady flow at the concluding stage. The starting limit determined in this manner agrees well with numerical calculations. B.J.

A82-25798 † **Allowance for flow nonuniformity in the minimum section in the optimal contouring of the expanding part of a nozzle (Ob uchete neravnomernosti potoka v minimal'nom sechenii pri optimal'nom profilirovanii rasshiriaiushcheisia chasti sopla).** A. N. Kraiko and N. I. Tilliaeva. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* Jan.-Feb. 1982, p. 184-186. 8 refs. In Russian.

The paper examines the problem of taking into account the actual nonuniform distributions of flow parameters in the minimum section of a Laval nozzle in the maximum-thrust design of its supersonic part for fixed counterpressure and maximum dimensions. Direct calculations show that the replacement of nonuniform distributions by uniform ones, i.e., the use of the plane transition surface assumption (the straight sonic line), produces contours which realize a thrust that is only hundredths of a percent less than the thrust of nozzles contoured for a curved sonic line. B.J.

A82-25874 **The bomber that radar cannot see.** B. Sweetman. *New Scientist,* vol. 93, Mar. 4, 1982, p. 565-568.

The evolution, design features, materials, and missions of the Stealth bomber under development are outlined. The idea of planes invisible to radar originated in the late 1940's with observations that certain aircraft configurations have less discernable radar images than others. High speed Soviet aircraft have tended to negate the use of low-flying, subsonic attack bombers, and the advent of carbon composite materials which absorb radio waves encouraged the creation of aircraft smaller than previous bombers, which can fly at any altitude and require minimum power for ECM because of a low radar profile. Advanced testing is currently under way at the skunk works, with concurrent Stealth technology runs at the perimeters of Soviet radar defenses to ascertain the EW configurations facing the Stealth. M.S.K.

A82-25923 # **A generalized Hill's method for the stability analysis of parametrically excited dynamic systems.** S. T. Noah and G. R. Hopkins (Texas A & M University, College Station, TX). *ASME, Transactions, Journal of Applied Mechanics,* vol. 49, Mar. 1982, p. 217-223. 40 refs.

In the analysis of various dynamical systems, representation of the motion involved frequently leads to a system of second-order linear differential equations with periodic coefficients. Examples include rotors subjected to pulsating torque, the aeroelastic stability of helicopter blades, missiles subjected to pulsating thrusts, and the attitude stability of spinning satellites. The methods available in cases in which the assumption of small variations in the amplitude of the periodic coefficients cannot be justified are essentially based on Floquet's work (1883). Hill utilized Floquet's solution to show that the stability of a second-order differential equation with periodic coefficients could be determined from a single transcendental equation. In the present study, the stability of the null solution for a general coupled system of linear ordinary equations with periodic coefficients is considered. G.R.

A82-25971 † **Inverse heat-transfer problems - Domains of application in the design and testing of technical systems (Obratnye zadachi teploobmena - Oblasti primeneniia pri proektirovanii i ispytaniiakh tekhnicheskikh ob'ektov).** V. P. Mishin and O. M. Alifanov. *Inzhenerno-Fizicheskii Zhurnal,* vol. 42, Feb. 1982, p. 181-192. 39 refs. In Russian.

The application of inverse heat-transfer methods to the design and testing of spacecraft systems is considered. Attention is given to the use of these methods for the development of mathematical thermal models, the design of thermally stressed structures, and the carrying out of model, bench, and flight tests. The planning of thermophysical experiments, with the aim of improving the efficiency of the testing of spacecraft systems, is discussed. B.J.

A82-25995 **Transonic flow past thin wings.** P. Niyogi (Indian Institute of Technology, Kharagpur, India). *Indian Academy of Sciences, Proceedings (Engineering Sciences),* vol. 4, Sept. 1981, p. 347-361. 23 refs.

This paper is devoted to a discussion of steady inviscid transonic flow past thin wings, with subsonic free-stream Mach number of less than 1, by the integral equation method. The integral equation formulation is developed for a thin unsymmetric wing at small incidence. A simple approximate analytical solution is presented for shock-free supercritical flow past a thin symmetric wing at zero incidence. The direct iteration scheme of Niyogi and Chakraborty is then extended to the three-dimensional zero incidence case, which may be used to obtain more accurate solutions for shock-free flows as well as for flows with shocks. The question of the existence and the uniqueness of a solution is studied by means of the Banach contraction mapping principle which establishes the condition of convergence of the direct iteration scheme. (Author)

A82-26025 **Materials and aeronautics.** J. Charnley (Ministry of Defence, London, England). *Aerospace* (UK), vol. 9, Feb. 1982, p. 16-23. 13 refs.

For airframe structural materials there are four essential requirements: low density, high strength, high stiffness, and good corrosion resistance. Aluminum alloys are generally used since they provide high fatigue resistance and tensile strength, are cheap and less susceptible to corrosion than steel. Plastic reinforced with glass or carbon fiber finds use in helicopter blades and airframes. Engines and turbine materials require high-temperature materials and techniques such as single-crystal fabrication. Titanium and nickel alloys are standard in compressor turbine disks. Silicon is used for integrated circuits; piezoelectric materials like quartz or lithium niobate are used in surface acoustic wave devices. Cadmium mercury telluride is a sensitive infrared detector, while yttrium aluminum garnet is useful in laser range finders and target markers. Electroluminescent and liquid crystal displays use polycrystalline powders or thin films of zinc sulfide or organic materials. C.D.

A82-26039 **Optimum three-dimensional flight of a supersonic aircraft.** C.-F. Lin (Applied Dynamics International, Ann Arbor, MI). *Applied Mathematical Modelling,* vol. 6, Apr. 1982, p. 124-129.

Optimum three-dimensional flight of supersonic aircraft is considered, particularly the minimization of flight time, which is important in the climbing and turning performance of a supersonic fighter. General properties of optimum three-dimensional flight are presented, and the maximum principle is used. Optimal control is obtained by a geometrical method using the domain of manoeuverability. (Author)

A82-26044 **AV-8B/Harrier GR.5 - Range, payload and VSTOL.** M. Lambert. *Interavia*, Mar. 1982, p. 224-227.

Harrier II is a compact, relatively lightweight day-and-night fair weather attack aircraft with sufficient maneuverability to escape from existing and expected Soviet interceptors. It is basically subsonic and not fitted with radar, but can push past Mach 1 in a shallow dive even with a large load of external stores. The sustained turn performance is stated to be better than 5 G at 5,000 ft. In a short take-off it can get airborne in 1000 ft. at 28,750 lb carrying more than 5000 lb of internal fuel and 16 Mk 82 bombs, giving a combat radius of 156 nmi. New digital avionics as well as available equipment give Harrier a precise and powerful attack capability. These include the standard US Navy AYK-14 mission computer, the ASN-130 one-box inertial navigator, the Smiths single-color head-up display, a digital air data computer and a radar altimeter. All are interconnected through the standard 1553A multiple digital data bus. Weapons systems include an angle-rate bombing system. C.D.

A82-26045 **Yak-36 Forger - The brand X VTOL fighter.** G. Lafon. *Interavia*, Mar. 1982, p. 228-230.

The design of the Forger, the Soviet Union's first VTOL fighter, presents an enigma. Its wing, with 42 deg sweep on the leading edge and a thickness/chord ratio of five or six percent, is inherently capable of transonic flight, yet all three aerodynamic control surfaces incorporate set-back hinges and trailing edge tabs, clear evidence that the controls are manually operated rather than powered. Manual controls are unsuitable for transonic flight. Forger's poor standard of combat performance is evident in its estimated sustained thrust-limited turn rate of 10 deg/sec at sea level and its maximum specific excess power of 500 ft/sec. A serious limitation on Forger's operational capability is that for any takeoff, the carrier has to steam, albeit slowly, in a direction which generates a light relative wind along the axis of the angled deck. It is concluded that, in spite of Forger's advanced technology for jet-borne flight and thrust management system, it must be employed to guard the Soviet fleets primarily against enemy maritime reconnaissance aircraft. C.D.

A82-26046 **On-board computers save fuel and help ATC.** C. Bulloch. *Interavia*, Mar. 1982, p. 251, 252.

Since 1975, NASA's Langley Research Center, in cooperation with the FAA, has pursued the Terminal Configured Vehicle program, which is concerned with the control and comportment of aircraft in the destination terminal area, from top-of-descent point or later to the conclusion of the landing roll. The program could, through improved airspace utilization, effect a 20 percent reduction in typical short/medium haul block time, which would translate into a 13 percent reduction in direct operating costs. The program concentrates on the cockpit, running experiments in a specially adapted Boeing 737 and Lockheed TriStar L-1011. TCV program experiments at Denver and Dallas-Fort Worth have shown that flight crews backed by automated on-board systems can perform more efficiently in the descent phase from cruise to the pre-approach metering fix point than they could under ATC guidance. Other on-board automation systems concepts are 'distributed control' and 'flow control'. C.D.

A82-26098 **Aerodynamics - Retrospect and prospect /The 21st Lanchester Memorial Lecture/.** E. W. E. Rogers (Royal Aircraft Establishment, Farnborough, Hants., England). *Aeronautical Journal*, vol. 86, Feb. 1982, p. 43-67. 103 refs.

The history of aerodynamics theory is reviewed, beginning from Newton's formulation for the force of a stream on an inclined plane to the present, and future directions for aerodynamics are indicated. The development of the Bernoulli theorem and the Navier-Stokes equation are considered, along with the inclusion of viscid and inviscid flows and Reynolds and Prandtl numbers for flow calculations. Drag and vortices were discovered, together with flow separation, and aerodynamics test facilities were constructed in the 19th century. The work of Lanchester is prominently featured, particularly for the criteria of stable flight. Work in the U.K. in the interval 1910-1945 is outlined. The advent of computers permitted transonic flows to be modeled and aided designers, and future activities are foreseen to concentrate on airframe efficiency, control, maneuvering, and comprise studies in aerodynamics, unsteady aerodynamics, flight dynamics, and rotorcraft aerodynamics. M.S.K.

A82-26121 **Advanced display-control concepts for power plant operation.** D. L. Parks (Boeing Co., Seattle, WA). *(Electric Power Research Institute, U.S. Department of Energy, and IEEE, Symposium on Nuclear Power Systems, 13th, San Francisco, CA, Oct. 21-23, 1981.) IEEE Transactions on Nuclear Science,* vol. NS-28, Feb. 1982, p. 945-951.

This paper illustrates some of the concepts being developed for aerospace systems that are being applied in commercial airplanes and could transfer to nuclear control room applications. The same hardware and software capabilities could be tailored to develop display-control features for nuclear operations. Electronic systems permit integrated formatting to avoid mental syntheses of data from several instruments; they allow the use of multifunction, time-shared displays rather than dedicated ones. Displays can be high or low resolution as conditions require, and messages should be short and readily interpretable regardless of software coding convenience. Multifunction display and switching provide a considerable increase in flexibility. Switch matrices can themselves be mini-displays and appropriate software can make the display 'smart'. Color coding and directional arrows can be used when an emergency requires instant action. Research is ongoing to make use of the voice as a switching method. It is possible to design a simplified monitoring-control display that incorporates multiple systems and parameters. C.D.

A82-26130 **Supercritical flow past symmetrical airfoils.** K.-M. Li and M. Holt (California, University, Berkeley, CA). *Journal of Fluid Mechanics*, vol. 114, Jan. 1982, p. 399-418. 27 refs. Grant No. AF-AFOSR-80-0230.

A numerical method is developed for computing steady supercritical flow about an ellipse at zero angle of attack. The flow is assumed to be two-dimensional, inviscid, isentropic and irrotational. The free-stream Mach number lies in the high subsonic range so that a shock wave occurs locally near the body. The full potential equations are solved by Telenin's method and the 'method of lines'. Smooth interpolating functions are assumed for the unknown flow variables in selected co-ordinate directions. The resulting set of ordinary differential equations is then integrated away from or along the body depending upon whether the flow is smooth or discontinuous. Jump conditions of the governing equations are applied across the shock wave so that it is perfectly sharp. A doublet solution for flow past a closed body is used as the far-field boundary condition. Supercritical flow calculations have been performed for ellipses with thickness ratio of 0.2 and 0.4 at various free-stream Mach numbers. The present results are compared with the shock-capturing method, and good agreement is obtained. (Author)

A82-26176 **Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers.** Barton, Australia, Institution of Engineers (National Conference Publication, No. 80/4), 1981. 590 p.

A review is provided of research and developments in hydraulics in Australasia during the past decade, and aspects of prospecting for wind energy are explored. Power generation from the East Australian current by use of arrays of submerged Darrieus vertical axis turbines is considered along with normal stress measurements for viscoelastic liquids using real time holographic interferometry of the Weissenberg effect, admissibility requirements and the least squares finite element solution for potential flow, two-dimensional solid blockage in a slotted wall wind tunnel, and the dynamic behavior of propeller anemometers. Attention is given to the potential flow signature of a turbulent spot, topographic forcing in nonlinear and linear barotropic models, flow control by secondary injection, friction factors of aqueous electrolyte solutions in pipe flow, the vortex shedding process behind a circular cylinder, and the use of the method of lines for choking flow in a nozzle. G.R.

A82-26181 # **Self streamlining wind tunnels without computers.** N. Pollock (Department of Defence, Aeronautical Research

A82-27133 **Advanced composites integral structures meet the challenge of future aircraft systems.** L. M. Lackman, W. L. O'Brien, and M. S. Loyd (Rockwell International Corp., Los Angeles, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 125-144.

In connection with economic considerations, current planning is based, both in the military and in commercial operations, on much longer spans of usage between major new system acquisitions. The continuing development of advanced structural airframe technology is required in order to implement new structural concepts which are superior in cost/weight performance to more conventional structure. These efforts have led logically to the use of advanced composite structural/material concepts. Attention is given to future fighter technology, concepts of advanced integral primary composite structure, aspects of composite material selection, a wing configuration selection study, a substructure-to-cover study, questions of tooling and manufacturing process development, and a test program. G.R.

A82-27138 **Continuous filament advanced composite isogrid - A promising structural concept.** L. W. Rehfield, R. B. Deo (Georgia Institute of Technology, Atlanta, GA), and G. D. Renieri (McDonnell Douglas Astronautics Co., St. Louis, MO). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 215-239. 9 refs. Contract No. F49620-77-C-0077.

It is pointed out that major airframe components are normally plate or shell type structures. Efficiency considerations dictate that the components be stiffened or semimonocoque in construction. The usual approach used to stiffen the components involves the employment of longitudinal stringers and frames or ribs which are orthogonal to the stringers. An alternative approach to stiffening is based on isogrid, which is a concept that employs a repetitive equilateral triangular pattern of stiffening ribs. The name 'isogrid' refers to the fact that the triangular grid behaves in a gross sense as an isotropic material. Unlike orthogonal stiffener grids, isogrid is a stable configuration and may be used with or without attached skin. Attention is given to continuous filament advanced composite isogrid, aspects of material selection, design contraints, and design analysis methodology. G.R.

A82-27139 **A crashworthiness test for composite fuselage structure.** R. L. Foye (U.S. Army, Research and Technology Laboratories, Moffett Field, CA), C. W. Swindlehurst (Martin Marietta Aerospace, Baltimore, MD), and W. T. Hodges (U.S. Army, Structures Laboratory, Hampton, VA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 241-257.

Crashworthiness or crash survival has many aspects, including fuel containment, seat design, landing gear design, flammability, smoke toxicity, flotation equipment, design criteria, and crew escape systems. The present investigation is concerned with the capacity of the fuselage structure to crush near the point of impact, thereby dissipating kinetic energy of the vehicle. Attention is given to the test specimens, the test procedure, and the results of a number of crushing tests of various composite and aluminum structural concepts. Skin/stringer tests for lightly loaded construction show conclusively that, unless energy absorption requirements are a design consideration, conventional sheet/stringer aluminum construction will be superior to composite sheet/stringer construction with regard to compressive energy absorption capacity. G.R.

A82-27141 **Impact resistance of graphite and hybrid configurations.** J. D. Labor and N. M. Bhatia (Northrop Corp., Aircraft Div., Hawthorne, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 293-312. 5 refs. Contracts No. F33615-76-C-3142; No. N62269-77-C-0401.

Impact damage in the case of composite materials does not currently involve safety-of-flight concerns for most applications. However, to prevent excessive inspection and repair actions, it is important to consider the effects of impact damage. The present investigation is concerned with low velocity impact studies which were conducted with the aid of instrumented impactors to obtain the force and energy values resulting from the impact. Several geometric configuration variables have been studied, including panel size, impact location, size and shape of the impactor, panel thickness, type of edge supports, and variations in the mass and velocity of the impactor. A separate series of tests was conducted on 1/2-inch thick monolithic panels which are typical of wing structures. Alternate materials were investigated including added plies of more ductile materials and replacement of basic graphite/epoxy tape prepreg with various woven material materials. G.R.

A82-27144 **Effects of lightning and nuclear electromagnetic pulse on an advanced composites aircraft.** V. Volpe and R. Carri (Grumman Aerospace Corp., Bethpage, NY). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 341-357. 11 refs. Contract No. F33615-77-C-5169.

Tests with a 1/2 scale model of the Advanced Design Composite Aircraft (ADCA) made of graphite/epoxy for the effects of lightning strikes and the development of a mathematical model to define the internal and external coupling for nuclear and EM pulses are reported. The lightning strike portion of the trails determined the attachment points, their distribution, and the frequency of occurrence. Features of the test model are outlined, along with trial procedures which included directions of the emitting electrodes to simulate yaw, pitch, and roll. Each extremity drew an equal number of strikes, and some degradation of the composite structure was observed at locations of multiple strikes. Nuclear EM pulses were examined and it was found that external coupling is concerned only with composite conductivities parallel to the surface, the aircraft is an infinite conductor, and charge and current densities were quantified and are provided. M.S.K.

A82-27145 **Problems and options in advanced composite repair.** S. H. Myhre and R. W. Kiger (Northrop Corp., Aircraft Div., Hawthorne, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 359-380. 9 refs. Contract No. F33615-76-C-3017.

The development of composite repair criteria and procedures for aircraft component are reported. The repairs are required to last twice the design life of the aircraft, match the ultimate strength capability, maintain the aerodynamic performance levels, and be enacted at a reasonable cost. The use of portable heating equipment has proven feasible, and repair tests on honeycomb panels accessible on both sides, on one side, a 50-ply laminate damaged 21 plies deep, and a 50-ply laminate accessible on both sides are reviewed. The failure loads, strains, and failure modes of the repaired panels are provided to demonstrate the possibility of returning a damaged composite to full strength. Specific recommendations are offered for patch material and joining, patch configurations, scarf lengths, hole edge peeling, incipient compression failure, wet laminate repair, thick laminate repair, sandwich panel repair, and blind side repair. M.S.K.

A82-27146 **A CAD approach to cost estimating composite aircraft.** R. A. Camin (General Dynamics Corp., Fort Worth, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 381-398. 8 refs.

The current state-of-the-art in aircraft cost estimating centers around vast collections of historical cost data. Probably the greatest deficiency of the current procedure is related to the absence of historical data for new technologies. An American aerospace company has developed a new approach with regard to cost estimation in the case of composite structures. The approach makes extensive use of a data base management system tailored to aircraft design and manufacturing, and interactive graphics techniques. Best described as a deterministic computer-aided design tool, STEP (Structural Technology Evaluation Program) is designed to capitalize on currently available data. Yet it remains sufficiently flexible to accept new data as it becomes available. A detailed description is presented of the methodology STEP uses during each phase of its operation. G.R.

A82-27151 **Prediction of cyclic growth of cracks and debonds in aluminum sheets reinforced with boron/epoxy.** G. L. Roderick (U.S. Army, Structures Laboratory, Hampton, VA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 467-481. 7 refs.

An analysis was developed to predict the cyclic growth of cracks and debonds in cracked metal sheets reinforced with uncracked composite sheets. Inplane and interlaminar stresses, the stress intensity at the crack tip, and the strain-energy-release rate at the

debond front were calculated with complex-variable Green's functions. An incremental analysis was developed that used the stress intensity to predict crack growth and the strain-energy-release rate to predict debond growth. To evaluate this analysis, fatigue tests were conducted on two panels having different thicknesses; each panel consisted of a cracked aluminum sheet bonded to an uncracked boron/epoxy sheet. For both panels, the predicted crack growths agreed with experimental values. In one panel, a significant debond occurred and was predicted by the analysis. In the other panel, the debond was very localized and somewhat smaller than predicted.
C.D.

A82-27152 **Application of advanced composite materials to helicopter airframe structures.** M. J. Rich (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 483-496. 8 refs.

Under a NASA contract an analytical assessment was made as to the effectiveness of a general application of advanced composites for helicopter airframes. The result of the study concluded that a light gage diagonal tension skin integrated with foam stabilized stringers/frames could result in appreciable weight savings and reduce life cycle costs. The study also indicated that reduced weight/cost might be achieved if a single co-cure could be used and if all Kevlar skins were substituted for graphite/Kevlar in the original design concept. A program initiated under another NASA contract is concerned with the design, the fabrication, and testing of helicopter advanced composite structures. A review is conducted of the progress made in connection with both NASA contracts. G.R.

A82-27153 **Design and production of fiberglass helicopter rotor blades.** C. E. Covington and P. S. Baumgardner (Bell Helicopter Textron, Fort Worth, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 497-513.

A prototype blade program to explore the potential of composite materials for rotor blades and to establish the necessary design and manufacturing technology for their economical production was conducted. The blade featured spar caps of spanwise oriented unidirectional glass. The fabrication and flight tests are described; results were excellent, the only drawbacks being the low amount of machine-laid structure and the low ballistic damage tolerance. The actual production program is then described, including the tooling, equipment (production orbital pin winding machine, production tube winding machine, compactor, integrally heated blade bonding press), winding techniques, material form, assembly techniques, quality control, qualification, flight, and fatigue tests, fail safety demonstration, environmental, ballistic survivability, and lightning tests. After completion of one-half of qualification testing, an FAA type certificate has been awarded. The blade will have at least a 10,000 hour life. C.D.

A82-27154 **Preliminary design of an advanced composite rotor hub for the UH-60A Black Hawk.** E. F. Olster (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT) and H. K. Reddick, Jr. (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 515-526. 9 refs. Army-supported research.

A program has been conducted to develop a preliminary design of a composite main rotor hub for the UH-60A Black Hawk helicopter. Graphite/epoxy was the chosen material because of its damage tolerance characteristics, and bolted joints for ballistic safety. A trade-off analysis was made consisting of three candidate hub concepts. The third concept, a configuration consisting of two horizontal flat plates connected by four filament-wound tubes housing elastomeric bearings, was selected for more in-depth design and analysis. Tests done were structural analysis, ballistic vulnerability analysis, damage tolerance assessment, reliability and maintainability assessment, cost assessment, lightning protection assessment, and radar cross section assessment. The damage tolerance of the composite hub was equal to metal for low energy impact damage but not quite as good for high impact, although it met the objectives. Reliability for the composite hub was superior to that of the metal hub. C.D.

A82-27155 **Evaluation of graphite/epoxy shims in a high capacity laminate helicopter bearing.** R. H. Finney (Lord Kinematics, Erie, PA) and S. C. Aker (Bell Helicopter Textron, Fort Worth, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 527-541.

A program undertaken to incorporate graphite/epoxy shims in a high-capacity elastomeric radial-journal bearing is discussed. The prime objective is to develop a method of reducing the weight in the helicopter dynamic system. Two different winding patterns are evaluated for the concentric tubular shims: + or - 45 deg, + or - 45 deg, + or - 45 deg, + or - 90 deg. The testing consists of ultimate torsion, ultimate axial and fatigue testing at accelerated loads and motions. The potential hysteresis heating of the elastomer is monitored with thermocouples on the shims and is found not to be a problem. The results of the fatigue tests are compared with previous test results on steel shim and aluminum shim specimens. The life of the bearing is found to be less dependent on the shim material than on the elastomer design and fabrication techniques. C.R.

A82-27156 **Mechanically-fastened joints for advanced composites - Phenomenological considerations and simple analyses.** L. J. Hart-Smith (Douglas Aircraft Co., Long Beach, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 543-574. 18 refs.

Various factors affecting the strength of bolted or riveted joints in advanced composites are discussed qualitatively. The mechanisms associated with each type of failure - tension, bearing, shearout, cleavage, and pull-through - are explained. The work is based mainly on experimental observations from which conclusions are drawn to integrate the study. A simple theory to explain the elastic stress concentrations at loaded bolt holes (in terms of the various geometric parameters) is deduced from experimental and analytical evidence for isotropic materials. Further tests on composite materials are used in deducing correlation factors which relate this theory to the limited, but significant, stress concentration relief observed before failure. C.R.

A82-27158 **Sensitivity of bonded and bolted joints in composites to load/environmental spectrum variations.** G. C. Grimes, L. L. Jeans, and E. Demuts. In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 619-644. 12 refs. Contract No. F33615-75-C-5236.

Results obtained after three years of a five-year research program are summarized. Most of the standard-design bolted joint testing is complete, but this is true of only 50% of the bonded joint testing. The load and environmental spectrum definitions are discussed here, along with the sensitivities observed to date. Areas where problems remain and where significant strides have been made are named, among them test machine development, materials and processes, quality assurance, experimental procedures, and environmental conditioning. Quality level variation is found to have a substantial effect on the test data variations, in some cases overshadowing the load and environmental sensitivity effects. It is reported that the testing of 20 replicate bonded joint specimens, simultaneously, proved to be a problem that was solved by changing the test fixture design. Sensitivity of the bolted joints to load and environmental spectral variations is found to be less than that of the bonded joints. C.R.

A82-27159 **Composite fasteners - A compatible joining technique for fibrous composites in structural design.** C. Tanis (USAF, Materials Laboratory, Wright-Patterson AFB, OH) and M. Poulios, Jr. (Vought Corp., Dallas, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 645-657. Contract No. F33615-77-C-5060.

A composite fastener program at the Air Force Materials Laboratory to establish and demonstrate a production method for fabricating non-corrosive composite fasteners is presented. The fasteners are suitable for fastening composite-to-composite structures, as well as metal-to-metal structures, and should be cost competitive and reduce overall aircraft weight as compared to metal fasteners. Fastener forming equipment is presented, and applications for helicopter composite structure are reviewed. Metal fastener-composite structure potential problem areas are discussed, including galvanic compatibility to graphite, interference fit, hole edge crushing and vibration damage. D.L.G.

STABILITY OF BOUNDARY LAYERS WITH POROUS SUCTION STRIPS: EXPERIMENT AND THEORY
G. A. Reynolds, W. S. Saric, H. L. Reed, and A. H. Nayfeh *In* NASA. Langley Research Center Laminar Flow Control Mar. 1982 p 63-74 ref

(Grants NsG-1608; NsG-1255; Contract N00014-75-C-0381)
Avail: NTIS HC A07/MF A01 CSCL 01A

Low turbulence tunnel experiments on the stability and transition of 2 D boundary layers on flat plates with and without suction are described. A number of general suction cases are discussed. Test results showed that the maximum stabilization occurred when the suction was moved toward the Branch I neutral point. An analytical study of the stability of two dimensional, incompressible boundary layer flows over plates with suction through porous strips was performed. The mean flow was calculated using linearized triple deck, closed form solutions. The stability results of the triple deck theory are shown to be in good agreement with those of the interacting boundary layers. An analytical optimization scheme for the suction configuration was developd. Numerical calculations were performed corresponding to the experimental configurations. In each case, the theory correctly predicts the experimental results. J.D.H.

N82-20153*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROBABILITY OF LAMINAR FLOW LOSS BECAUSE OF ICE CRYSTAL ENCOUNTERS
Richard E. Davis *In its* Laminar Flow Control Mar. 1982 p 75-94 refs
Avail: NTIS HC A07/MF A01 CSCL 01A

A method for combining the cloud detector observation results from the Global Atmospheric Sampling Program (GASP) with Knollenberg probe observations of cloud particle concentration from other programs to derive estimates of the ambient concentration of particles larger than a given size was developed. The method was applied to estimate the probability of encountering particle concentrations which would degrade the performance of laminar flow control (LFC) aircraft. It is concluded that LF loss should occur only about one percent of the time in clear air and that flight within clouds should always result in a significant loss of LF, with 90 percent LF loss occurring about one percent of the time. Preliminary estimates of cloud encounter probability are presented for four airline routes, and conclusions are presented as to the best altitudes for cloud avoidance in extratropical and tropical latitudes. Author

N82-20154*# Rockwell International Corp., Los Angeles, Calif. Aircraft Div.
SPF/DB TITANIUM CONCEPTS FOR STRUCTURAL EFFICIENCY FOI HC
V. E. Wilson *In* NASA. Langley Research Center Laminar Flow Control Mar. 1982 p 95-110

Avail: NTIS HC A07/MF A01 CSCL 01A

Illustrations for a presentation on superplastic forming/diffusion bonding titanium design concepts are presented. Sandwich skin panels with hat section, semicircular corrugation, sine wave, and truss cores are shown. The fabrication of wing panels is illustrated, and applications to the design of advanced variable sweep bombers summarized. J.D.H.

N82-20155*# McDonnell-Douglas Corp., Long Beach, Calif.
SPF/DB TITANIUM LFC POROUS PANEL CONCEPT
Neil R. Williams *In* NASA. Langley Research Center Laminar Flow Control Mar. 1982 p 111-138

Avail: NTIS HC A07/MF A01 CSCL 01A

Illustrations for a presentation demonstrating superplastic forming/diffusion bonding titanium porous panels are presented. Fabrication phases, sandwich panels, load bearing qualities, microstructure, and panel surface after finishing are illustrated. J.D.H.

N82-20156*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC INTERNAL PERFORMANCE OF SINGLE EXPANSION-RAMP NOZZLES WITH THRUST VECTORING AND REVERSING
Richard J. Re and Bobby L. Berrier Mar. 1982 143 p refs
(NASA-TP-1962; L-14902; NAS 1.60:1962) Avail: NTIS HC A07/MF A01 CSCL 01A

The effects of geometric design parameters on the internal performance of nonaxisymmetric single expansion-ramp nozzles were investigated at nozzle pressure ratios up to approximately 10. Forward-flight (cruise), vectored-thrust, and reversed-thrust nozzle operating modes were investigated. B.W.

N82-20157# Transportation Systems Center, Cambridge, Mass. Research and Special Programs Administration.
CHICAGO MONOSTATIC ACOUSTIC VORTEX SENSING SYSTEM. VOLUME 2: DECAY OF B-707 AND DC-8 VORTICES Final Report, Oct. 1976 - Dec. 1979
D. C. Burnham and J. N. Hallock Washington FAA Sep. 1981 136 p refs
(AD-A109518; DOT-TSL-FAA-79-18-Vol-2; FAA-RD-79-103-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 01/2

A Monostatic Acoustic Vortex Sensing System (MAVSS) was installed at Chicago's O'Hare International Airport to measure the strength and decay of aircraft wake vortices from landing aircraft. The MAVSS consists of an array of acoustic antennas which measure the vertical profile up to 60-m altitude of the vertical component of the wind. The decay in wake vortex strength is measured as the vortex passes over successive antennas in the array. In this volume, the data are analyzed to examine whether landing B-707 and DC-8 aircraft need to be divided into Heavy and non-Heavy categories on the basis of wake vortex hazard. Volume I (published in October 1979) described the MAVSS principles of operation, the hardware developed, and the data reduction methods employed. GRA

N82-20158# Calspan Field Services, Inc., Arnold Air Force Station, Tenn. AEDC Div.
AERODYNAMIC CHARACTERISTICS AND STORE LOADS OF A 1/24 SCALE F-111 AIRCRAFT MODEL WITH THREE EXTERNAL STORE LOADINGS Final Report
C. F. Anderson AEDC Jul. 1981 41 p refs Sponsored by Air Force
(AD-A109449; AEDC-TSR-81-P30) Avail: NTIS HC A03/MF A01 CSCL 02/4

The 1/24 scale F-111 aircraft model was tested in the Aerodynamic Wind Tunnel (4T) to obtain simultaneous measurements of the aircraft and store aerodynamic loads. Static stability and store loads data were obtained at 4 wind sweep angles for Mach numbers from 0.6 to 1.2. The angle of attack was varied from -2 to 24 deg and the angle of sideslip was varied from -10 to 10 deg. Author (GRA)

N82-20159# Committee on Commerce, Science, and Transportation (U. S. Senate).
FUTURE OF GENERAL AND COMMUTER AVIATION TECHNOLOGY AND TRADE
Washington GPO 1981 317 p refs Joint hearing before the Subcomm. on Transportation, Aviation and Materials of the Comm. on Sci. and Technol. and the Subcomm. on Aviation of the Comm. on Commerce, Sci., and Transportation, 97th Congr., 1st Sess., No. 42, 27 Aug. 1981
(GPO-85-832) Avail: Subcomm. on Transportation, Aviation and Materials

Problems affecting the aircraft industry are discussed and include Federal tax laws, interest rates, fuel costs, and government involvement in civil aviation. Aeronautical research programs and the funding that they receive were reviewed. The economic contribution of general aviation is considered and ways in which government can assist the general aviation industries are highlighted. T.M.

N82-20160# Naval Ocean Systems Center, San Diego, Calif. Bioacoustics and Bionics Div.
PROJECT SEA HUNT: A REPORT ON PROTOTYPE DEVELOPMENT AND TESTS Final Report, 1979 - 1980
J. V. Simmons, Jr. Jul. 1981 66 p refs
(AD-A109510; NOSC/TR-746) Avail: NTIS HC A04/MF A01 CSCL 06/7

During FY 79-80, a prototype Sea Hunt system was built and tested. Sea Hunt utilizes trained pigeons carried in a container attached to the underside of a helicopter to locate objects colored red, yellow or orange. Development of hardware and pigeon training methods are presented. Conclusions based on test data are: Sea Hunt improves detection and localization of appropriate targets; the system is reliable and easily serviced and maintained. A recommendation is made to conduct operational field testing of Sea Hunt at a Coast Guard air station. GRA

N82-20161# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
DEVELOPMENT OF AN EJECTION SEAT BALLAST BLOCK FOR THE S-3A AIRCRAFT Final Report
Dan Lorch 4 Nov. 1981 18 p
(AD-A109808; NADC-81272-60) Avail: NTIS HC A02/MF A01 CSCL 01/3

The purpose of this Ballast Block is to ballast an unoccupied ejection seat in the S-3A aircraft. The block adjusts the mass of the seat and the center of gravity to fall within acceptable limits to prevent rapid seat acceleration and tumbling both of which might cause interference with an ejected occupied seat. Author (GRA)

N82-20162# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
DEVELOPMENT OF A SUPPORTED AIRBAG EJECTION RESTRAINT (SABER) FOR WINDBLAST PROTECTION
Dan Lorch 4 Nov. 1981 22 p refs
(AD-A109807; NADC-81274-60) Avail: NTIS HC A02/MF A01 CSCL 01/3

This is a preliminary investigation to develop an airbag mounted on an ejection seat. The airbag is designed to deploy during an emergency ejection and may provide both prepositioning of the aircrewman and windblast protection for his upper torso. The airbag is tightly packed on a flexible steel strap which is mounted at the aircrewman's shoulder level. Quick disconnect fittings on either side permit the crewmen to enter the seat; they also disconnect the entire system upon seat/man separation. Author (GRA)

N82-20163# National Oceanic and Atmospheric Administration, Norman, Okla.
DOPPLER RADAR-RESEARCH AND APPLICATION TO AVIATION FLIGHT SAFETY, 1977 - 1979 Final Report
J. T. Lee Jun. 1981 45 p refs
(Contract DOT-FA77WAI-808)
(AD-A109845; FAA-RD-81-79) Avail: NTIS HC A03/MF A01 CSCL 17/9

Thunderstorm turbulence detection and the display of the turbulence location offer a significant advance toward improvement in flight safety and utilization of critical air space. A cooperative program involving the Federal Aviation Administration, U.S. Air Force's Aeronautical Systems Command, and the National Oceanic and Atmospheric Administration's National Severe Storms Laboratory has been conducted under a code name of 'Rough Rider'. An F-4-C aircraft instrumented to record turbulence, temperature and wind during thunderstorm penetrations has been used to obtain in situ measurements of these parameters concurrently with Doppler and conventional weather radar observations. The results of this program indicate that the Doppler measured radial wind component's spectral width holds promise as a turbulence indicator. Turbulence of the severe or greater nature was always accompanied by spectral widths greater than 4 m/s. A second part of the program was to display forenoted Doppler radar data in real time at a Radar Approach Control office and at an Air Route Traffic Control Center. This display provided an insight into requirements for an operational system. Author (GRA)

N82-20164# Environmental Research and Technology, Inc., Concord, Mass.
DETECTION AND TRACKING ALGORITHM REFINEMENT Final Technical Report
G. B. Gustafson and R. K. Crane Washington DOT Oct. 1981 194 p refs
(Contracts DTFA01-81-Y-10521; NA-81-RAC-00072)
(AD-A109517; ERT-P-8035; FAA-RD-81-80) Avail: NTIS HC A09/MF A01 CSCL 01/2

A previous aircraft hazard detection algorithm shown to have high detectability but with a high false alarm rate has been modified to improve reliability for aircraft warnings. The derived Doppler parameter tangential (or radial) shear is incorporated as a radar cell attribute and used in the determination of significant hazard. Further modifications to the processing structure allow for radar operation in a non-automatic mode, thereby accommodating arbitrary changes in PRF, integrator type or scan geometry. A revised output format provides a sorted hierarchical list of derived meteorological structures in a form readily adapted to a graphics display. Author (GRA)

N82-20165# Army Test and Evaluation Command, Fort Huachuca, Ariz.
SAFETY (AVIATION MATERIAL) Final Report
18 Jan. 1982 45 p
(AD-A110381) Avail: NTIS HC A03/MF A01 CSCL 01/2

Existing test methodology and techniques necessary to determine the degree to which aviation material meets the safety requirements stated in the requirements documents are discussed. These procedures cover the requirements, aircraft armaments, airframes, ejection seats, and electrical, mechanical, and miscellaneous hazards related to Army aircraft. A guide for laser safety is included. R.J.F.

N82-20166 Ohio Univ., Athens.
UTD TERRAIN REFLECTION MODEL WITH APPLICATION TO ILS GLIDE SLOPE Ph.D. Thesis
Vichate Ungvichian 1981 278 p
Avail: Univ. Microfilms Order No. 8126070

A terrain reflection model based on the uniform theory of diffraction (UTD) is described which can accommodate any piecewise linear terrain profile, requires less computer time than the physical optics models, is capable of including transverse terrain effects, and determines the reflected fields with all important diffraction and blockage effects included. The results when compared to measurements indicate that this UTD model can accurately predict ILS flight path effects due to ground irregularity. Futhermore, the results obtained from this UTD model are compared against the predictions of a previously developed physical optics (PO) model. UTD and PO predictions in most cases agree with one another, but better results are obtained from the UTD model for truncated or severely upsloping terrain. Dissert. Abstr.

N82-20167# Committee on Science and Technology (U. S. House)
AIR TRAFFIC CONTROL EN ROUTE COMPUTER MODERNIZATION
Washington GPO 1981 28 p Report presented by the Subcomm. on Transportation, Aviation, and Materials of the Comm. on Sci. and Technol., 97th Congr., 1st Sess., Aug. 1981
(GPO-82-773) Avail: Subcomm. on Transportation, Aviation, and Materials

The need for full modernization and replacement of the enroute computers is discussed. Interim replacement options are considered. The service life of the current system and the FAA's ability to manage the enroute computer modernization were examined. Anticipated costs and computer outages are presented. It is concluded that proceeding with full modernization is the best way to achieve needed productivity benefits and assure continued safe operation in the enroute airspace. T.M.

N82-20168# Committee on Science and Technology (U. S. House).
FAA AIR TRAFFIC CONTROL COMPUTER MODERNIZATION
Washington GPO 1981 101 p Hearings before the Subcomm. on Transportation, Aviation and Materials of the Comm. on Sci. and Technol., 97th Congr., 1st Sess., No. 13, 16-18 Jun. 1981
(GPO-82-375) Avail: Subcomm. on Transportation, Aviation and Materials

The issues of air traffic safety, the separation of air traffic, and the movement of traffic from one part of the country to another, are discussed. The proposed computer system was examined. Questions concerning whether the current system can be safely operated while a new system is being implemented and whether the overall cost effectiveness of the new system is adequate, are considered. The FAA's plans were reviewed along with its management of the current system. T.M.

N82-20169# Committee on Science and Technology (U. S. House).
AIRCRAFT COLLISION AVOIDANCE AND AIR TRAFFIC SAFETY
Washington GPO 1982 80 p Hearing before the Subcomm. on Transportation Aviation and Materials of the Comm. on Sci. and Technol., 97th Congr., 1st Sess., No. 52, 2 Sep. 1981
(GPO-88-645) Avail: Subcomm. on Transportation, Aviation and Materials

J. Stoppel and M. Degener (DFVLR, Goettingen, West Germany) Ottobrun, West Germany 8 Sep. 1980 20 p refs Presented at 6th European Rotorcraft and Powered Lift Aircraft Forum, Bristol, England, 16-19 Sep. 1980 Sponsored by Bundesministerium fuer Forschung und Technologie
(MBB-UD-303/80-O) Avail: NTIS HC A02/MF A01

A BO-105 helicopter was studied using the NASTRAN program applied to one model with 4400 degrees of freedom and a second with 1300 degrees of freedom. Ground vibration tests were performed on an actual helicopter (CO-105) to determining the modal parameters of the structure within a frequency of 56 Hz for comparison with the models. The suspended aircraft was excited by six electrodynamic exciters. Dynamic response was measured by inductive accelerometers. Comparison of model results with test data shows that most all measured natural modes have a corresponding analytical mode. There were 30 measured natural modes up to 60 Hz. Some 40 modes, including the six rigid body modes, were calculated. Only five modes in the high frequency range from 50 to 70 Hz have no equivalent from measurements. Most of the frequencies show very good agreement between measurement and calculation. Less than perfect correlation is seen for the pitching modes, which are influenced mainly by the tail boom. Central processor times on an IBM 360-370 model 3033 were 100 sec and 500 sec for the simple and complex models, respectively. Author (ESA)

N82-21187# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Drehfluegler.

A HINGELESS TAIL ROTOR OF FIBER COMPOSITE CONSTRUCTION AND VIBRATION ISOLATOR SYSTEMS (ARIS, AVIS) FOR HELICOPTERS [GELENKLOSER HECKROTOR IN FASERVERBUND-BAUWEISE UND SCHWINGUNGS-ISOLATIONSSYSTEME (ARIS, ASIS) FUER HUBSCHRAUBER]

G. Reichert 8 Oct. 1980 37 p refs In GERMAN Presented at 2nd Bundesministerium fuer Forsch. und Technol. Statusseminar on Luftfahrtforsch. und Luftfahrttechnol., Garmisch-Partenkirchen, West Germany, 8-9 Oct. 1980
(MBB-UD-311/80-OE) Avail: NTIS HC A03/MF A01

Systems research and development were undertaken in order to reduce cost and improve characteristics of helicopters. An experimental tail rotor development program and methods of reducing airframe vibration are centered on. Definition, construction, and testing of a three-blade and a four-blade tail rotor system are discussed. Two vibration isolator systems (ARIS; AVIS) are next described. Passive and active force isolators were developed and tested in engineering models. It is proposed that all this equipment be subjected to full scale testing in helicopter assemblies. Author (ESA)

N82-21188# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Drehfluegler.

RATIONAL PRODUCTION METHODS FOR THE MANUFACTURE OF HELICOPTER ROTOR BLADES [RATIONELLE FERTIGUNGSVERFAHREN ZUR HERSTELLUNG VON HUBSCHRAUBER-ROTORBLAETTERN]

Klaus Brunsch 8 Oct. 1980 27 p refs In GERMAN Presented at 2nd Bundesministerium fuer Forschung und Technologie Statusseminair Luftfahrtforsch. und Luftfahrttechnol., Garmisch-Partenkirchen, West Germany, 8-9 Oct. 1980
(MBB-UD-312/80-OE) Avail: NTIS HC A03/MF A01

The construction of BO-105/BK 117 rotor blade and the partial mechanization of its production are described. Series production of this rotor blade involves severe tolerances, regarding mass, mass distribution, geometry, mechanical properties, aerodynamics, etc. The necessity of these requirements is explained and consequences on the design of mass manufacturing work stations are pointed out. Development underway to fully automate rotor blade manufacture is then reviewed. Author (ESA)

N82-21190# Royal Aircraft Establishment, Farnborough (England).

REDUCTION OF STRUCTURAL VIBRATION BY A DYNAMIC ABSORBER

J. M. Williams Dec. 1980 29 p refs
(RAE-TM-AERO-1881; BR77778) Avail: NTIS HC A03/MF A01

The transmission of vibration in dynamic systems is described. An example conswasting of two freely supported elastic plates, connected by a rigid link was studied in connection with helicopter gear boxes and cabins. The addition of a dynamic absorber to such a system can significantly attenuate the transmitted velocities over a chosen narrow frequency band. The harmonic excitation of thin plates is explained. Author (ESA)

N82-21191# National Mechanical Engineering Research Inst., Pretoria (South Africa).

USE OF COMPOSITE MATERIALS FOR HELICOPTER ROTOR BLADES

M. S. Hunt 1980 33 p refs
(PB82-124041; CSIR-ME-1674; ISBN-0-7988-1470-5) Copyright. Avail: NTIS HC A03/MF A01 CSCL 01C

Arguments in favor of the use of fiber reinforced composite materials for helicopter rotor blades are presented. The design and manufacturing techniques developed in an Institute are discussed and some of the results obtained in the structural testing program are given. GRA

N82-21192# British Aerospace Aircraft Group, Preston (England).

SAFRA: CONTROLLED REQUIREMENTS EXPRESSION

D. Y. Forsyth and A. O. Ward Jan. 1980 105 p refs
(BAe-TNAAS-84) Avail: NTIS HC A06/MF A01

A collection of procedures and tools for improving the way in which avionic system and software requirements are derived and validated are described. In the contex of SAFRA, the method of derivation proposed is a technique termed controlled requirements expression (CORE) and the information structure is modelled on an existing standard for requirement specification. The automated aid is the University of Michigan's ISDOS consisting of the problem statement language (PSL) and problem statement analyzer. The diagrammatic notation used in CORE is explained and the representation of the various relationships in the PSL are shown. Examples are depicted for an avionics system. Author (ESA)

N82-21193*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

COLD-AIR PERFORMANCE OF A 15.41-cm-TIP-DIAMETER AXIAL-FLOW POWER TURBINE WITH VARIABLE-AREA STATOR DESIGNED FOR A 75-kW AUTOMOTIVE GAS TURBINE ENGINE Final Report

Kerry L. McLallin, Milton G. Kofskey, and Robert Y. Wong Feb. 1982 33 p refs
(Contract DE-AI01-77CS-51040)
(NASA-TM-82644; E-899; NAS 1.15:82644; DOE/NASA/51040-30) Avail: NTIS HC A03/MF A01 CSCL 21E

An experimental evaluation of the aerodynamic performance of the axial flow, variable area stator power turbine stage for the Department of Energy upgraded automotive gas turbine engine was conducted in cold air. The interstage transition duct, the variable area stator, the rotor, and the exit diffuser were included in the evaluation of the turbine stage. The measured total blading efficiency was 0.096 less than the design value of 0.85. Large radial gradients in flow conditions were found at the exit of the interstage duct that adversely affected power turbine performance. Although power turbine efficiency was less than design, the turbine operating line corresponding to the steady state road load power curve was within 0.02 of the maximum available stage efficiency at any given speed. Author

N82-21194*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PRELIMINARY RESULTS ON PERFORMANCE TESTING OF A TURBOCHARGED ROTARY COMBUSTION ENGINE

P. R. Meng, W. J. Rice, H. J. Schock, and D. P. Pringle 1982 24 p refs Presented at the 1982 Soc. of Automotive Engrs. Intern. Congr. and Exposition, Detroit, 22-26 Feb. 1982
(NASA-TM-82772; E-1097; NAS 1.15:82772) Avail: NTIS HC A02/MF A01 CSCL 21E

The performance of a turbocharged rotary engine at power levels above 75 kW (100 hp) was studied. A twin rotor turbocharged Mazda engine was tested at speeds of 3000 to 6000 rpm and boost pressures to 7 psi. The NASA developed combustion diagnostic instrumentation was used to quantify indicated and pumping mean effect pressures, peak pressure, and face to face variability on a cycle by cycle basis. Results of this testing showed that a 5900 rpm a 36 percent increase in power was obtained by operating the engine in the turbocharged configuration. When operating with lean carburetor jets at 106 hp (78.3 kW) and 4000 rpm, a brake specific fuel consumption of 0.45 lbm/lb-hr was measured. B.W.

N82-21195*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ANALYTICAL INVESTIGATION OF NONRECOVERABLE STALL

Leon M. Wenzel and William M. Bruton Feb. 1982 23 p refs

(NASA-TM-82792; E-1126; NAS 1.15:82792) Avail: NTIS HC A02/MF A01 CSCL 21E

A lumped parameter model of the TF34 engine is formulated to study nonrecoverable stall. Features of the model include forward and reverse flow, radial flow in the fan, and variable corrected speed. The purpose of the study is to point out those parameters to which recoverability is highly sensitive but are not well known. Experimental research may then be directed toward identification of the parameters in that category. Compressor performance in the positive flow region and radial flow in the fan are shown to be important but unknown parameters determining recoverability. Other parameters such as compressor performance during reverse flow and in-stall efficiency have relatively small impact on recoverability. Author

N82-21196*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.

ENERGY EFFICIENT ENGINE SHROUDLESS, HOLLOW FAN BLADE TECHNOLOGY REPORT

C. J. Michael Dec. 1981 91 p refs

(Contract NAS3-20646)

(NASA-CR-165586; NAS 1.26:165586; PWA-5594-199) Avail: NTIS HC A05/MF A01 CSCL 21E

The Shroudless, Hollow Fan Blade Technology program was structured to support the design, fabrication, and subsequent evaluation of advanced hollow and shroudless blades for the Energy Efficient Engine fan component. Rockwell International was initially selected to produce hollow airfoil specimens employing the superplastic forming/diffusion bonding (SPF/DB) fabrication technique. Rockwell demonstrated that a titanium hollow structure could be fabricated utilizing SPF/DB manufacturing methods. However, some problems such as sharp internal cavity radii and unsatisfactory secondary bonding of the edge and root details prevented production of the required quantity of fatigue test specimens. Subsequently, TRW was selected to (1) produce hollow airfoil test specimens utilizing a laminate-core/hot isostatic press/diffusion bond approach, and (2) manufacture full-size hollow prototype fan blades utilizing the technology that evolved from the specimen fabrication effort. TRW established elements of blade design and defined laminate-core/hot isostatic press/diffusion bonding fabrication techniques to produce test specimens. This fabrication technology was utilized to produce full size hollow fan blades in which the HIP'ed parts were cambered/twisted/isothermally forged, finish machined, and delivered to Pratt & Whitney Aircraft and NASA for further evaluation. Author

N82-21197*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.

CF6 JET ENGINE DIAGNOSTICS PROGRAM: HIGH PRESSURE COMPRESSOR CLEARANCE INVESTIGATION

M. A. Radomski Jan. 1982 48 p ref

(Contract NAS3-20631)

(NASA-CR-165580; NAS 1.26:165580; R82AEB169) Avail: NTIS HC A03/MF A01 CSCL 21E

The effects of high pressure compressor clearance changes on engine performance were experimentally determined on a CF6 core engine. The results indicate that a one percent reduction in normalized average clearance, expressed as a fraction of airfoil length, improves compressor efficiency by one percent. Compressor clearances are reduced by the application of rotor bore cooling, insulation of the stator casing, and use of a low coefficient of expansion material in the aft stages. This improvement amounts to a reduction of normalized average clearance of 0.78 percent, relative to CF6-50 compressor, which is equivalent to an improvement in compressor efficiency of 0.78 percent. J.M.S.

N82-21198*# Computing Devices Co., Ottawa (Ontario).

OPTIMIZATION OF THRUST ALGORITHM CALIBRATION FOR COMPUTING SYSTEM (TCS) FOR THRUST THE NASA HIGHLY MANEUVERABLE AIRCRAFT TECHNOLOGY (HIMAT) VEHICLE'S PROPULSION SYSTEM Final Report

M. J. Hamer and R. I. Alexander Dec. 1981 77 p refs

(Contract NAS4-2812)

(NASA-CR-163121; NAS 1.26:163121; A011/FR) Avail: NTIS HC A05/MF A01 CSCL 21E

A simplified gross thrust computing technique for the HiMAT J85-GE-21 engine using altitude facility data was evaluated. The results over the full engine envelope for both the standard engine mode and the open nozzle engine mode are presented. Results using afterburner casing static pressure taps are compared to those using liner static pressure taps. It is found that the technique is very accurate for both the standard and open nozzle engine modes. The difference in the algorithm accuracy for a calibration based on data from one test condition was small compared to a calibration based on data from all of the test conditions. E.A.K.

N82-21199# General Motors Corp., Indianapolis, Ind. Detroit Diesel Allison Div.

EXPERIMENTAL INVESTIGATION OF TURBINE ENDWALL HEAT TRANSFER. VOLUME 1: DESCRIPTION OF EXPERIMENTAL HARDWARE AND TEST CONDITIONS Final Report, 1 Aug. 1977 - 31 Aug. 1981

L. D. Hylton, M. S. Mihelc, E. R. Turner, and R. E. York Wright-Patterson AFB, Ohio AFWAL Aug. 1981 147 p ref 3 Vol.

(Contract F33615-77-C-2030; AF Proj. 3066)

(AD-A110332; DDA-EDR-10363-Vol-1; AFWAL-TR-81-2077-Vol-1) Avail: NTIS HC A07/MF A01 CSCL 21/5

Two turbine cascades were tested at simulated engine conditions to provide a data base of endwall heat transfer data. This data base is intended to be sufficiently complete to provide verification data for refined computational models developed to predict first-stage stator endwall heat transfer in advanced turbine engines. A linear, two dimensional cascade provided the bulk of the data. This cascade provided data to separate the effects of exit Mach number, exit Reynolds number, inlet boundary layer thickness, gas-to-wall temperature ratio, inlet pressure gradients, and inlet temperature gradients. In addition, adiabatic wall temperature and inlet turbulence intensity data are available for this linear cascade runs. A computerized data base was generated. This data base, with its associated software management system, provides the user with relatively easy access to the vast amount of data generated. A full annular, three dimensional cascade was used to acquire data for identifying the radial pressure gradient effects. Tests in the annular cascade were run over a wide range of exit Mach and Reynolds numbers and gas-to-wall temperature ratios, all at levels typical to advanced engines. The facilities, cascade geometry, instrumentation, and data acquisition techniques are discussed, as well as a summary of test conditions and a sample summary data set for both cascades. R.J.F.

N82-21200# Detroit Diesel Allison, Indianapolis, Ind.

EXPERIMENTAL INVESTIGATION OF TURBINE ENDWALL HEAT TRANSFER. VOLUME 2: LINEAR AND ANNULAR CASCADE SUMMARY DATA SETS Final Report, 1 Aug. 1977 - 31 Aug. 1981

L. D. Hylton, M. S. Mihelc, E. R. Turner, and R. E. York Wright-Patterson AFB, Ohio AFWAL Aug. 1981 329 p 3 Vol.

(Contract F33615-77-C-2030; AF Proj. 3066)

(AD-A110333; DDA-EDR-10363-Vol-2; AFWAL-TR-81-2077-Vol-2) Avail: NTIS HC A15/MF A01 CSCL 21/5

Two turbine cascades were tested at simulated engine conditions to provide a data base of endwall heat transfer data. This data base is intended to be sufficiently complete to provide verification data for refined computational models developed to predict first-stage stator endwall heat transfer in advanced turbine engines. Summary plots of the results of both the linear and the annular cascade test programs are given. The data is sufficient to allow the designer to estimate the endwall cooling levels and to locate areas of high heat transfer rates. R.J.F.

N82-21201# Detroit Diesel Allison, Indianapolis, Ind.

EXPERIMENTAL INVESTIGATION OF TURBINE ENDWALL HEAT TRANSFER. VOLUME 3: DATA BASE SYSTEM Final Report, 1 Aug. 1977 - 31 Aug. 1981

L. D. Hylton, M. S. Mihelc, E. R. Turner, and R. E. York Wright-Patterson AFB, Ohio AFWAL Sep. 1981 81 p 3 Vol.

(Contract F33615-77-C-2030; AF Proj. 3066)

(AD-A110334; DDA-EDR-10363-Vol-3; AFWAL-TR-81-2077-Vol-3) Avail: NTIS HC A04/MF A01 CSCL 21/5

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Laboratories, Victoria, Australia). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 123-126. 6 refs.

A brief review of wind tunnel wall interference is presented with particular emphasis on 'self correcting' and 'correctable interference' tunnels. Two simple methods of modifying tunnel walls to approximate unconstrained flow streamlines are presented. One method, which requires only very limited computation, involves the use of an analytic expression for the far field flow, and the other, which requires no computation, uses a purely mechanical wall arrangement which deflects appropriately under the applied pressure field. (Author)

A82-26184 # **The dynamic behaviour of propeller anemometers.** P. S. Jackson (Auckland, University, Auckland, New Zealand). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 139-142. 11 refs.

A model equation is developed to predict the response of propeller anemometers in turbulent flow. The equation is nonlinear, and is shown to describe anemometer motion correctly for the situations which are easily simulated in a wind tunnel. Implications for the measurement of turbulent flows are discussed. (Author)

A82-26194 # **The effect of induced sound on the flow around a rectangular body in a wind tunnel.** M. C. Welsh (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Melbourne, Australia), R. Parker, and S. A. T. Stoneman (Swansea, University College, Swansea, Wales). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 275-278. 14 refs.

The changed character of the flow around a thick blunt flat plate in a flow duct containing self induced resonant sound has been examined. It has been established that induced sound can 'feed back' on the vortex shedding process causing a step change in the shedding frequency increasing the Strouhal number for the plate by up to twice its normal value. In this flow state, the leading edge separation bubble reattaches much closer to the plate's leading edge than normal. Vortices are then shed from the position of flow reattachment and are conveyed downstream to form the wake. (Author)

A82-26208 # **Effect of wakes of upstream stator blades on the rotor of an axial flow compressor.** A. R. Oliver (Tasmania, University, Hobart, Australia). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 385-388. 12 refs. Research supported by the Australian Research Grants Committee.

The effect of stator wakes passing over rotor blades in shifting stagnation points, points of separation and transition as well as the length of transition is discussed. The trailing edge problem is presented. A method of calculating stator wake transport in two dimensional incompressible flow is presented but not concluded for want of knowledge of a viscous trailing edge condition. (Author)

A82-26222 # **An experimental study of steady and quasi-steady jet flaps.** Y. P. Chai and J. M. Simmons (Queensland, University, Brisbane, Australia). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 521-524. 11 refs.

Measurements of the spread of a steady jet flap are reported, as are uses of the measurements in refining the quasi-steady theory. Also described is the extension of this theory to cases involving pitching and plunging motions. The measured center-line of a steady jet flap is shown to differ significantly from that predicted by inviscid steady theory. Incorporation of the measured center-line into the quasi-steady theory of Simmons and Platzer (1978) improves the agreement with measurements of the frequency response of lift on a fixed airfoil with an oscillating jet flap. Simple extensions of the quasi-steady model to cases of pitching and plunging of a jet-flapped airfoil give predictions of frequency response of lift which have trends consistent with measurements. C.R.

A82-26223 # **Results of recent measurements on an oscillating aerofoil.** K. H. Ly and V. A. L. Chasteau (Auckland, University, Auckland, New Zealand). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 525-528. 14 refs.

Forces measured on a two-dimensional NACA 0012 aerofoil oscillating at pitch amplitudes up to 34 deg and heave amplitudes up to 0.2 of chord are presented. Reynolds numbers ranged from 70,000 to 330,000 and reduced frequencies of up to 0.45. In pitch, the greatest differences from the theoretical flat plate prediction occurred at the lowest reduced frequencies and larger amplitudes, and were the result of complicated real flow stall effects; results tended to converge to theoretical values for reduced frequencies greater than 0.4. In pure heave, forward thrust occurred for increasing reduced frequencies. The propulsive efficiency is discussed. Dynamic stall angles in pure pitch are also presented. (Author)

A82-26227 # **The vortex flow field generated by a hovering helicopter.** K. R. Reddy (Department of Defence, Aeronautical Research Laboratories, Melbourne, Australia). In: Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers. Barton, Australia, Institution of Engineers, 1981, p. 553-556. 11 refs.

Important vortex elements in the wake of a hovering helicopter are identified on the basis of well established fixed wing theory. The vortex positions are specified using experimental results. To make the problem mathematically simple, Willmer's rectangularisation principle is introduced. Using this wake model, the calculated velocity field and blade loading are compared with available helicopter flight data. The comparison shows that the present simple method yields satisfactory results. (Author)

A82-26298 # **Helicopter rotor performance improvement by utilization of swept back parabolic blade tip.** J. J. Philippe and P. Lafon (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), no. 5, 1981, p. 55, 56. Research supported by the Direction des Recherches, Etudes et Techniques.

Swept back parabolic tips designed to improve the working conditions of an advancing blade by reducing the intensity of the shock waves and the drag associated with such shocks are tested in the S2 wind tunnel at Chalais-Meudon on a three-bladed rotor. The influence of the sole planform of the blade tips on the total aerodynamic performance of the rotor, twist angle and the profiles of the tips remaining identical is investigated, and the performance of the reference rotor with rectangular blades is compared with that of the rotor fitted with swept back parabolic tips. Results show that the blade tip optimized for advancing blade conditions gives an overall improvement in performance. D.L.G.

A82-26299 # **Real time digital filtering test in the S1 continuous wind tunnel at Modane.** J. Appel (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), no. 5, 1981, p. 57-61.

A real time digital filtering test was performed in October 1980 in the S1 wind tunnel at Modane to compare the performances of digital filters programmed at various cut-off frequencies with those of analog filters already in use. Results confirm the interest of low-pass filtering at a very low cut-off frequency for restoring static parameters while the model is performing an angle of attack sweep in continuous mode. At the cut-off frequency of 0.5 Hz, the Keimo analog filters are of good quality since the results they give coincide with those of the digital filters to within 0.0001. D.L.G.

A82-26313 **Torsional vibrations of non-uniform rotating blades with attachment flexibility.** V. T. Nagaraj and N. Sahu (Hindustan Aeronautics, Ltd., Helicopter Design Bureau, Bangalore, India). *Journal of Sound and Vibration*, vol. 80, Feb. 8, 1982, p. 401-411. 8 refs.

The torsional vibrations of non-uniform pretwisted rotating blades are studied by using finite element methods based on both the Rayleigh-Ritz and Galerkin formulations. The apparent differences between the matrices obtained from these formulations are explained and, as obtained by using three different orders of elements, results are presented for blades with flexibly attached roots and for a non-uniform blade representative of a bearingless rotor. A parametric study is carried out to resolve a controversy regarding the relative importance of certain terms in the equations of motion of pretwisted rotating blades. In Appendix I, an exact solution is presented for the torsional vibrations of flexibly attached rotating blades with piecewise constant inertia and elastic properties, which serves as a benchmark solution for the finite element results. (Author)

A82-26318 * **High frequency sound emission from moving point multipole sources embedded in arbitrary transversely sheared mean flows.** M. E. Goldstein (NASA, Lewis Research Center, Cleveland, OH). *Journal of Sound and Vibration*, vol. 80, Feb. 22, 1982, p. 499-522. 25 refs.

Formulas are derived for the high frequency sound emission from moving point multipole sources embedded in an arbitrary unidirectional transversely sheared mean flow. The results are used to study the sound generated by non-axisymmetric turbulent jets. The effect of the asymmetry in both the mean flow and the source distribution is accounted for by a 'circumferential directivity factor', which is easily calculated from the solution of a second order ordinary differential equation in the general case and from an explicit formula when the mean flow is symmetric but the source location is not. This factor is used to assess the potential of employing asymmetric velocity profiles that redirect the sound upward to reduce the noise radiation below the flight path of a jet aircraft. (Author)

A82-26319 * **On the generation of side-edge flap noise.** M. S. Howe (Bolt Beranek and Newman, Inc., Cambridge, MA). *Journal of Sound and Vibration*, vol. 80, Feb. 22, 1982, p. 555-573. 21 refs. NASA-supported research.

A theory is proposed for estimating the noise generated at the side edges of part span trailing edge flaps in terms of pressure fluctuations measured just in-board of the side edge on the upper surface of the flap. Asymptotic formulas are developed in the opposite extremes of Lorentz contracted acoustic wavelength large/small compared with the chord of the flap. Interpolation between these limiting results enables the field shape and its dependence on subsonic forward flight speed to be predicted over the whole frequency range. It is shown that the mean width of the side edge gap between the flap and the undeflected portion of the airfoil has a significant influence on the intensity of the radiated sound. The results indicate that the noise generated at a single side of a full scale part span flap can exceed that produced along the whole of the trailing edge of the flap by 3 dB or more. (Author)

A82-26320 **Comments on 'Nature of inlet turbulence and strut flow disturbances and their effect on turbomachinery rotor noise'.** G. F. Homicz (Calspan Advanced Technology Center, Buffalo, NY). *Journal of Sound and Vibration*, vol. 80, Feb. 22, 1982, p. 575, 576; Authors' Reply, p. 576, 577. 6 refs.

A82-26340 # **Unsteady response of rectangular wings in spanwise uniform shear flow.** M. Kobayakawa (Kyoto University, Kyoto, Japan). *AIAA Journal*, vol. 20, Apr. 1982, p. 471-476. 8 refs.

An unsteady lifting surface theory based on inviscid and incompressible spanwise shear flow is presented. The stream approaching a thin, rectangular wing is assumed to have a linear shear distribution, and a Poisson type equation is defined for the velocity in unsteady cases, and a Laplace equation for steady cases. The lift distribution is calculated and solved by a method of solution by mode functions. The lifting surface technique in potential flow is shown to be applicable for numerical solutions if the Mach number is set at zero. Calculations are also performed for the response functions to sinusoidal heaving oscillations and sinusoidal gust, corresponding to the Theodorsen function and the Sears function, respectively. M.S.K.

A82-26366 * # **Computational fluid dynamics - The coming revolution.** R. A. Graves, Jr. (NASA, Washington, DC). *Astronautics and Aeronautics*, vol. 20, Mar. 1982, p. 20-28, 62. 28 refs.

The development of aerodynamic theory is traced from the days of Aristotle to the present, with the next stage in computational fluid dynamics dependent on superspeed computers for flow calculations. Additional attention is given to the history of numerical methods inherent in writing computer codes applicable to viscous and inviscid analyses for complex configurations. The advent of the superconducting Josephson junction is noted to place configurational demands on computer design to avoid limitations imposed by the speed of light, and a Japanese projection of a computer capable of several hundred billion operations/sec is mentioned. The NASA Numerical Aerodynamic Simulator is described, showing capabilities of a billion operations/sec with a memory of 240 million words using existing technology. Near-term advances in fluid dynamics are discussed. M.S.K.

A82-26367 * # **Lightning detection and ranging.** C. L. Lennon (NASA, Kennedy Space Center, Cocoa Beach, FL) and H. A. Poehler (RCA Service Co., Cocoa Beach, FL). *Astronautics and Aeronautics*, vol. 20, Mar. 1982, p. 29-31. 6 refs.

A lightning detector and ranging (LDAR) system developed at the Kennedy Space Center and recently transferred to Wallops Island is described. The system detects pulsed VHF signals due to electrical discharges occurring in a thunderstorm by means of 56-75 MHz receivers located at the hub and at the tips of 8 km radial lines. Incoming signals are transmitted by wideband links to a central computing facility which processes the times of arrival, using two independent calculations to determine position in order to guard against false data. The results are plotted on a CRT display, and an example of a thunderstorm lightning strike detection near Kennedy Space Center is outlined. The LDAR correctly identified potential ground strike zones and additionally provided a high correlation between updrafts and ground strikes. M.S.K.

A82-26376 **The Model 412 multi-bladed rotor system.** A. W. Meyers, N. B. Phillips, and D. E. Snyder (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 9 p. 7 refs.

A multibladed soft-inplane main rotor system is being certified for the Bell Model 412 utility helicopter. This rotor system is a third-generation design and is the result of technology developed in earlier multibladed soft-inplane rotor programs. The new rotor was designed to easily retrofit existing helicopters in the field. The design of a fiberglass blade was also included in the program. Torsional loads encountered during the development program were higher than anticipated because of the influence of live twist on rotor response and control loads. Increased trailing edge reflex was used to significantly affect both rotor response and control loads. Bell's technical predictions for the rotor have been confirmed in the development and FAA certification phases of the program. (Author)

A82-26377 **Dynamic stability of low effective flap hinge BMR concepts.** F. J. McHugh, J. A. Staley, and M. W. Sheffler (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 11 p. 6 refs.

The considered Bearingless Main Rotor (BMR) test shows that a five percent effective flap hinge BMR which has acceptable aeroelastic stability characteristics is feasible. Significant advancements regarding the development of the BMR concept will potentially provide a reduction in hub weight, piece parts, and fabrication costs while reducing gust sensitivity and vibratory hub moments. Dual beam and single flex strap designs studied have an equivalent flap hinge offset of approximately five percent of blade radius. The baseline dual beam was found to have a higher level of stability than the single flex strap. G.R.

A82-26378 **Design for the operating environment - Ring-fin tail rotor program.** H. E. Lamont (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 16 p. 6 refs.

A82-27162 **Statistical analysis methods for characterizing composite materials.** G. H. Lemon, J. M. Norton, and M. E. Waddoups (General Dynamics Corp., Fort Worth, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p.733-759. 19 refs. Research supported by the General Dynamics Independent Research and Development Program and U.S. Air Force.

A strength-bounded wearout model and a method for calculating fleet material allowables are developed. Residual strength evaluation and wearout are noted as necessary for reliable assessment of composite components, and the determination of design allowables is reviewed, especially for the dependence on the Weibull shape factor. Assumptions postulated by fracture kinetics for characterizing wearout include the existence of preexisting flaws, growth in a deterministic manner depending on material, stress, and flaw features, and the critical load being a function of instantaneous flaw state. Lifetime predictions are analyzed, along with ramp loading and static failure, creep loading, and closure. M.S.K.

A82-27163 **Durability evaluation of highly stressed wing box structure.** R. V. Wolff and D. J. Wilkins (General Dynamics Corp., Fort Worth, TX). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 761-769. 11 refs. Contract No. F33615-73-C-5104.

Box beams representing a single cell of a multispar conceptual composite wing for a fighter aircraft were tested for durability and damage tolerance. The beams were fabricated from graphite-epoxy tape with aluminum honeycomb core and steel bolts. The selected load conditions were: (1) a cold subsonic temperature that produced more torsion and (2) a supersonic, hot, wet temperature with more relative bending. Static tests were conducted at room temperature, dry conditions, showing the composite to be competitive with metal. Under cold, subsonic conditions five of twelve beams delaminated, partly because of stacking sequence. Five of these beams failed in compression. Under hot (250 deg F), wet, supersonic conditions, five beams were blistered badly enough to be useless after thirteen weeks, due to the exceeding of the local glass transition temperature because of thermal spiking. One-lifetime fatigue testing under these conditions resulted in failure in compression. It is concluded that the use of current epoxy laminating resins in hot, wet conditions is questionable. C.D.

A82-27167 **Growth of four flaw types in graphite/epoxy composites due to fully reversed fatigue.** K. E. Hofer, Jr. and J. Jollay, Jr. (IIT Research Institute, Chicago, IL). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 831-845. 13 refs. Research supported by the IIT Research Institute, Rockwell International Corp., and U.S. Air Force.

An experimental program is presented, which investigates the serviceability of graphite/epoxy composites in terms of the propagation of flaws due to fully reversed fatigue. Flaws most likely to affect tensile residual strength of the composites are studied, which consist of a hole in a composite panel, an embedded sheet of foreign matter, a ply dropped from the composite, and surface scratches. Ultrasonic tracking of the flaw growth appears to be feasible, with the effect of flaw growth on the tensile residual strengths of both the tested laminate types appearing to be minimal or nonexistent. D.L.G.

A82-27168 **Effects of defects on tension coupons undergoing an accelerated environmental spectrum.** D. Y. Konishi (Rockwell International Corp., Los Angeles, CA). In: Fibrous composites in structural design. New York, Plenum Press, 1980, p. 847-860. 7 refs.

A screening program was done to assess the criticality, or ability to sustain a required tensile load, of the effect of defects, including holes, delaminations, ply separations, and scratches in an advanced composite coupon. A coupon test program is described and the results reported. A test spectrum was used which realistically represented the temperature/moisture environment for the aircraft component. A room temperature/dry spectrum was also used for baseline purposes. The AS3501-5A graphite/epoxy failed at the average stress 88.5 ksi. Room temperature residual strength after two lifetimes of ambient spectrum loading was 83 ksi or 94 percent of static strength. A 0.25 inch hole flaw had 43.5 ksi average static strength. Wet, hot specimens had 49.6 ksi static strength. Other flaw and laminate types had similar results. C.D.

A82-27187 **Advanced medium scale real-time system.** T. N. Tucker (U.S. Army, Washington, DC) and A. L. Kelley (Sangamo Weston, Inc., Sarasota, FL). In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980. Research Triangle Park, NC, Instrument Society of America, 1980, p. 157-168.

The Real-time Data Acquisition and Processing System (RDAPS), which is being delivered to the U.S. Army for rapid processing of test data at remote sites, is described as a computer-controlled telemetry system that is portable, while having enough capacity to convert data at an up to 50 K word rate to engineering units, and then display selected parameters pertinent to inflight testing decisions. The RDAPS system will be used at Edwards Air Force Base, California, in the airworthiness qualifications of such flight vehicles as advanced helicopters. The system will compile, process and display quantitative test data on stability and control, overall performance, vibration, and stress analysis. O.C.

A82-27188 * **Telemetry Computer System at Wallops Flight Center.** H. Bell (NASA, Wallops Flight Center, Wallops Island, VA) and J. Strock (Sangamo Weston, Inc., Sarasota, FL). In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980. Research Triangle Park, NC, Instrument Society of America, 1980, p. 169-183.

This paper describes the Telemetry Computer System in operation at NASA's Wallops Flight Center for real-time or off-line processing, storage, and display of telemetry data from rockets and aircraft. The system accepts one or two PCM data streams and one FM multiplex, converting each type of data into computer format and merging time-of-day information. A data compressor merges the active streams, and removes redundant data if desired. Dual minicomputers process data for display, while storing information on computer tape for further processing. Real-time displays are located at the station, at the rocket launch control center, and in the aircraft control tower. The system is set up and run by standard telemetry software under control of engineers and technicians. Expansion capability is built into the system to take care of possible future requirements. (Author)

A82-27209 **Small EHF/SHF airborne SATCOM terminal.** A. L. Johnson (USAF, Avionics Laboratory, Wright-Patterson AFB, OH). In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980. Research Triangle Park, NC, Instrument Society of America, 1980, p. 419-422.

A fifth-generation airborne microwave satellite communication system currently under development is discussed. The terminal, operating in the EHF and SHF bands, is designed to provide secure, anti-jam communication for the airborne command post fleet of EC-135 aircraft. Among the terminal's characteristics are the following: an air-cooled transmitter, a parabolic dish antenna, intermediate frequencies of 70 and 700 MHz, an uncoded parametric amplifier, a rubidium frequency standard, a weight of 1,200 pounds, and a volume of 18 cu ft. The packaging will allow the terminal to be distributed in available rack space rather than requiring a large integrated rack installation as required in previous microwave systems. The processor-controlled terminal is being designed to minimize the complexity involved in turning on and locking up the SATCOM system. A prestored set of frequency, power level, antenna pointing and Doppler mode will permit the terminal to be brought up automatically in a preprogrammed mode without operator interventions. C.R.

A82-27228 **Selection of optimum antennas for tracking telemetry intrumented airborne vehicles.** A. Sullivan (Electro Magnetic Processes, Inc., Chatsworth, CA). In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980. Research Triangle Park, NC, Instrument Society of America, 1980, p. 597-607.

A simplified method of developing the link budget to determine the required antenna gain is presented. A heuristic analysis is presented to determine whether a low cost fixed antenna can be used or if a tracking system is required. If a tracking system is required, an analysis is presented to determine whether a single axis tracking system will suffice or a two axis tracking system is required. The pros and cons of single channel monopulse versus conical scan are also presented. Additionally, tracking system acquisition aid techniques are discussed. (Author)

A82-27231 **Terrain reflection effects on data reception from airborne vehicles.** C. W. Chandler. In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980. Research Triangle Park, NC, Instrument Society of America, 1980, p. 625-630.

It is noted that propagation phenomena, particularly the interference between the direct and terrain reflected waves, strongly affect the path loss between the transmitting and receiving antennas. A method of analysis and computer-drawn patterns are presented to show the multi-lobed character and deep nulls that result in range-altitude coverage. The effects created by the antenna pattern, the type of terrain, and polarization are shown. Attention is also given to applying the results to system design. C.R.

A82-27398 **Studies in the history and theory of development of aviation and rocketry and space science and technology (Issledovaniia po istorii i teorii razvitiia aviatsionnoi i raketno-kosmicheskoi nauki i tekhniki).** Edited by B. V. Raushenbakh. Moscow, Izdatel'stvo Nauka, 1981. 284 p. In Russian.

A series of papers is presented on the history and development of aviation and space science and technology. Attention is given to the work of Tsiolkovskii, Kondratiuk, Tsander, and Korolev, and to Soviet efforts in rocket engine design, automatic control of spacecraft, and manned space flight. The development of jet engines and aircraft control systems in the Soviet Union is also considered. B.J.

A82-27401 **Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981.** Conference sponsored by the Society for the Advancement of Material and Process Engineering. Azusa, CA, Society for the Advancement of Material and Process Engineering (National SAMPE Technical Conference Series. Volume 13), 1981. 709 p. $80.

Advanced composites materials, applications, processing, and combinations were discussed. Fillers and reinforcements for improved plastics were examined, along with core materials for use with polymer and graphite face sheets, curing process effects on adhesive properties, moisture degradation in composites, and the effects of environmental exposure. Applications and tests of composites and foams for aircraft structures, spacecraft antenna reflectors, solar mirrors, a helicopter fuselage, electronic systems encapsulants, and wings were described. Different mixtures for structural adhesives, metal-to-metal bonding, and polymers based on botanical oils were detailed. Preparation techniques for fiber reinforcements, with radiation curing, for low temperature field repairs, and for thickness control to enhance peel strength were reviewed. M.S.K.

A82-27402 **Flight service evaluation of advanced structures.** C. W. Schneider (Lockheed-Georgia Co., Advanced Structures Dept., Marietta, GA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 1-12. 8 refs.

Extended service tests of composite structures on operational aircraft are reported, specifically for the use of boron and graphite-epoxy materials at Lockheed. Reviews are given of a boron wing tip on a C-141, along with a boron oleo door, boron slats on the C-5A, and a boron-reinforced center wing on a C-130. Graphite structures have been used as C-5 wing-to-body fairing panels, fixed trailing edge panels, and a fairing covering the joint between the center and outer wing. Another program currently involves composite leading edges for the C-141. The composites have all replaced metal materials at a lower cost and have displayed greater durability, to the extent that the metal substructures sometimes corroded beneath the composite components, which showed no signs of wear. The flight program reported had run for 10 yr, with further tests continuing on the C-141 leading edge. M.S.K.

A82-27403 **Damage tolerance and durability design of composite structures for commercial aircraft.** E. Chow and C. Y. Kam (Douglas Aircraft Co., Long Beach, CA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 13-25. 8 refs.

The development of composite structures to the point of acceptability by the FAA for use in commercial aircraft, and to the consideration of composite structures for safety-critical aircraft components is reviewed, based on the experience at McDonnell Douglas. Secondary structures such as the DC-10 upper aft rudder, vertical stabilizer trailing edge panel, and floor beams, a Kevlar tail cone and fan cowl doors and a Kevlar/polyimide nacelle stang fairing for the DC-9 are described. Current testing includes a nose gear aft door, aileron access panel, and the vertical stabilizer box for the DC-10. Initial tests established the mechanical characteristics of the composites, the structural reliability of the design concepts, and confirmed the structural integrity of the integrated parts. Fibrous composites are noted to differ from metal parts in anisotropy and nonhomogeneity and comprehensive trials to solve problems of potential complex failure modes are recommended. M.S.K.

A82-27404 **Light weight adhesive joining of composite structures.** K. D. Creasy (M & T Chemicals, Inc., Los Angeles, CA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 26-31.

The procedures, characteristics, and performance of adhesively joined composite structures for aircraft parts are outlined. Adhesives are noted to form effective moisture barriers, provide good stress distribution, avoid bimetallic corrosion, and offer fatigue resistance and low cost use. Methods of field repairs are reviewed, and adhesive bonding of aluminum and NOMEX honeycomb aircraft parts have been demonstrated to have an overlap shear strength ranging from 1000-2500 psi. Heat cure epoxy adhesives have shown high compressive strength at 350 F, although maintaining a sufficient rigidity modulus with desirable resilience and toughness above 250 F has caused difficulties. Urethane compounds have been developed which retain strength below -65 F and a peel strength of 150 psi is projected in applications on aluminum substrates. The thixotropy displayed after initial curing allows gap filling to occur. M.S.K.

A82-27407 **Service sensitivity of polysulfide sealants.** R. J. Stout (General Dynamics Corp., Fort Worth, TX). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 64-78.

Investigations into incidents of sealant chalking and sponging of MIL-S-83430 sealants in Air Force aircraft are reported. The polysulfide sealants began chalking a short time after entering service. Subsequent X-ray spectrographic analyses of chalked and unchalked surfaces revealed the chalk to be a concentration of sealant fillers, mainly calcium carbonate. The chalking was precipitated by fuel extraction of the elastomeric component of the sealant and accelerated by the presence of mercaptans and metallic ions in the fuel. The chalking penetration into the sealant was determined to be of negligible rate. Sealant sponging in fuel test tanks was examined in terms of a thermal history and service use of a fuel-saturated sealant at high temperatures were concluded to cause the sponging. Qualifications tests did not include rapidly increasing temperatures when transition to supersonic speeds occurs with a nearly empty fuel tank. M.S.K.

A82-27412 **A new resin for field repair.** E. S. Dilanni, A. H. McLeod (Acurex Corp., Aerotherm Div., Mountain View, CA), F. J. Riel (Rohr Industries, Inc., Chula Vista, CA), and R. H. Gray (Rohr Industries, Inc., Riverside, CA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, The threat alert and collision avoidance system is examined. The technical and policy aspects of air transportation safety are reviewed. S.L.

N82-20172# Transportation Systems Center, Cambridge, Mass. Research and Special Programs Administration.
STATISTICAL ANALYSIS AND TIME SERIES MODELING OF AIR TRAFFIC OPERATIONS DATA FROM FLIGHT SERVICE STATIONS AND TERMINAL RADAR APPROACH CONTROL FACILITIES: TWO CASE STUDIES Final Report, Oct. 1979 - Sep. 1980
Norman J. Meyerhoff and George H. Wang Washington FAA Oct. 1981 60 p refs
(AD-A109873; TSC-FAA-81-18; DTS-522; DOT-FAA-EM-82-13) Avail: NTIS HC A04/MF A01 CSCL 17/7

Two statistical procedures have been developed to estimate hourly or daily aircraft counts. These counts can then be transformed into estimates of instantaneous air counts. The first procedure estimates the stable (deterministic) mean level of hourly or day of the week patterns by statistical models. The second procedure estimates both deterministic and stochastic periodic (hourly or day of the week) patterns by stochastic time series models. Both statistical procedures have been used to analyze traffic at the St. Louis TRACON and Los Angeles Flight Service Station. This report analyzes hourly variations in operations at the St. Louis TRACON, for each day in four representative months in 1979. It also analyzes daily variations for three months in 1979 of flight plan activity at the Los Angeles FSS. The results of these analyses are given preliminary interpretations, and are available for possible application to other facilities. They are also available for other applications, such as estimation of instantaneous air counts in hubs. GRA

N82-20173# Federal Aviation Administration, Washington, D.C. Systems Research and Development Service.
OPERATIONAL DELAY DAY FORECASTS FOR THE 20 AIR ROUTE TRAFFIC CONTROL CENTERS FOR THE YEAR 1982 THROUGH 2011 Final Report
W. Livingston Jun. 1981 24 p refs
(AD-A109844; FAA-RD-81-93) Avail: NTIS HC A02/MF A01 CSCL 17/7

The effect of forecasts of increased traffic growth at each of the 20 CONUS Air Route Traffic Control Centers has been examined to determine the impact upon processor utilization of the Central Computer Complex at each center. The study assumes continuation of the current operational capabilities and procedures at each center, and is based upon field data collected between June 1980 and January 1981, and the June 1981 forecast of the IFR aircraft handled at the 20 Air Route Traffic Control Centers. Other factors such as channel utilization are not included in this phase of the study. Author (GRA)

N82-20174*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SIMULATION OF THE XV-15 TILT ROTOR RESEARCH AIRCRAFT
Gary B. Churchill (Army Aeromechanics Lab., Moffett Field, Calif.) and Daniel C. Dugan Mar. 1982 23 p refs
(NASA-TM-84222; A-8848; NAS 1.15:84222) Avail: NTIS HC A02/MF A01 CSCL 01C

The effective use of simulation from issuance of the request for proposal through conduct of a flight test program for the XV-15 Tilt Rotor Research Aircraft is discussed. From program inception, simulation complemented all phases of XV-15 development. The initial simulation evaluations during the source evaluation board proceedings contributed significantly to performance and stability and control evaluations. Eight subsequent simulation periods provided major contributions in the areas of control concepts; cockpit configuration; handling qualities; pilot workload; failure effects and recovery procedures; and flight boundary problems and recovery procedures. The fidelity of the simulation also made it a valuable pilot training aid, as well as a suitable tool for military and civil mission evaluations. Simulation also provided valuable design data for refinement of automatic flight control systems. Throughout the program, fidelity was a prime issue and resulted in unique data and methods for fidelity evaluation which are presented and discussed. R.J.F.

N82-20175*# National Aeronautics and Space Administration, Washington, D. C.
FATIGUE ANALYSIS OF COMPOSITE MATERIALS USING THE FAIL-SAFE CONCEPT
G. Stievenard Jan. 1982 11 p Transl. into ENGLISH of AGARD Rept. AGARD-CP-297 (France), Mar. 1981 p 1-15 Translation was announced as N81-26131 Transl. by SCITRAN, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76671; NAS 1.15:76671) Avail: NTIS HC A02/MF A01 CSCL 11D

If R1 is the probability of having a crack on a flight component and R2 is the probability of seeing this crack propagate between two scheduled inspections, the global failure regulation states that this product must not exceed 0.0000001. R.J.F.

N82-20176# Aeronautical Research Labs., Melbourne (Australia).
SEA KING FLIGHT TESTS PITOT-STATIC PROBE AND DIRECTIONAL VANE INSTRUMENTATION
D. T. Hourigan and M. J. Williams Jul. 1981 26 p refs
(AD-A109427; ARL/AERO-TM-332; AR-002-298) Avail: NTIS HC A03/MF A01 CSCL 01/3

A short description is given of the pitot-static pressure probe and vanes mounted on a nose boom for Sea King flight tests. Also described is a probe which was trailed below the aircraft to determine the position error of the boom probe. Results of wind tunnel calibrations of these probes are given. Author (GRA)

N82-20177# Aeronautical Research Labs., Melbourne (Australia).
BOOM PROBE POSITION ERROR CORRECTIONS FOR SEA KING Mk 50 FLIGHT TESTS
M. J. Williams Jul. 1981 34 p refs
(AD-A109428; ARL/AERO-TM-331; AR-002-297) Avail: NTIS HC A03/MF A01 CSCL 01/3

Position error has been determined for a nose-boom mounted pitot static probe installed on a Sea King Mk. 50 helicopter. The error is sensibly constant in the speed range 35 - 110 knots and is unchanged in climb and descent. Corrections to be applied to indicated nose boom values are 7.5 knots in velocity, and up to 80 ft. in altitude. Author (GRA)

N82-20178# Analytical Methods, Inc., Redmond, Wash.
A SURFACE SINGULARITY METHOD FOR ROTORS IN HOVER OR CLIMB Final Report, 29 Mar. 1979 - 30 Sep. 1981
J. Summa and Brian Maskew Dec. 1981 142 p refs
(Contract DAAJ02-76-C-0069; DA Proj. 1F2-62209-AH-76)
(AD-A109687; AMI-8103; USAAVRADCOM-TR-81-D-23) Avail: NTIS HC A07/MF A01 CSCL 20/4

A surface singularity potential flow code, ROTAIR, has been assembled for the calculation of detailed surface pressures on rotors in hover or climb. This method is basically a marriage of two codes: the fixed-wing surface singularity doublet code and the rotor lifting-surface code. The program includes a tip vortex separation model. Also, the rotor tip surface is panelled so that pressures are calculated right around the tip-edge surface. Preliminary calculations have verified the capabilities of the program for computing blade surface properties in the presence of a close-vortex passage. Additionally, calculated pressure distributions compare favorably with experimental data for a low aspect ratio two-bladed rotor, and the calculated circulation distribution is consistent with that computed earlier with the lifting-surface code. Finally, the newly developed far-wake doublet model promises to keep computing efforts practical. Author (GRA)

N82-20179# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
A SHORT TAKEOFF PERFORMANCE COMPUTER PROGRAM Final Report
David Bruce Kobus 25 Nov. 1981 122 p refs
(ZR020302)
(AD-A109861; NADC-81259-60) Avail: NTIS HC A06/MF A01 CSCL 01/3

A short takeoff performance computer program has been developed by NAVAIRDEVCEN to be used for performance estimation and conceptual aircraft design. Author (GRA)

N82-20180*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMULATOR STUDY OF A PICTORIAL DISPLAY FOR GENERAL AVIATION INSTRUMENT FLIGHT

James J. Adams Mar. 1982 58 p refs
(NASA-TP-1963; L-14675; NAS 1.60:1963) Avail: NTIS HC A04/MF A01 CSCL 01D

A simulation study of a computer drawn pictorial display involved a flight task that included an en route segment, terminal area maneuvering, a final approach, a missed approach, and a hold. The pictorial display consists of the drawing of boxes which either move along the desired path or are fixed at designated way points. Two boxes may be shown at all times, one related to the active way point and the other related to the standby way point. Ground tracks and vertical profiles of the flights, time histories of the final approach, and comments were obtained from time pilots. The results demonstrate the accuracy and consistency with which the segments of the flight are executed. The pilots found that the display is easy to learn and to use; that it provides good situation awareness, and that it could improve the safety of flight. The small size of the display, the lack of numerical information on pitch, roll, and heading angles, and the lack of definition of the boundaries of the conventional glide slope and localizer areas were criticized. A.R.H.

N82-20181# Arizona Univ., Tucson. Optical Sciences Center.
DESIGN OF A CATADIOPTRIC VCASS HELMET-MOUNTED DISPLAY Final Report, 15 Feb. 1979 - 15 Sep. 1979
R. A. Buchroeder, G. W. Seeley, and D. Vukobratovich Wright-Patterson AFB, Ohio AFAMRL Nov. 1981 73 p refs
(Contract F33615-78-C-0520; AF Proj. 7184)
(AD-A109431; AFAMRL-TR-81-133) Avail: NTIS HC A04/MF A01 CSCL 01/3

A new wide-angle, dual-eye, helmet-mounted display has been designed. Two images combine, with a 15 deg. central field overlap, to provide a panoramic display 102 deg. wide by 45 deg. tall, with a resolution to approximately 1000 TV lines per eye. The image-generating device is a miniature 18 mm CRT. The optics, which are symmetrical for both eyes, comprise partially reflective plastic reflectors, five small glass lens elements, and a 2:1 fiber optic magnifier. A 12 mm exit pupil is obtained with enough eye relief to permit the user to wear glasses, with an interpupillary adjustment of 58 to 73 mm. Total weight of the device, not including the Air Force flight helmet type HGU-2A/P upon which it is mounted, is less than 3 pounds. Author (GRA)

N82-20182*# National Aeronautics and Space Administration, Washington, D. C.
CONDITIONS OF GENERATION AND METHODS OF DAMPING THE INLET VORTEX OF A TURBOJET ENGINE
Tadeusz Gajewski Mar. 1982 14 p refs Transl. into ENGLISH from Tech. Lotnicza Astronaut. (Poland), v. 35, no. 11, Nov. 1980 p 5-8 Translation was announced as A81-19442 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76678; NAS 1.15:76678) Avail: NTIS HC A02/MF A01 CSCL 21E

An aeromechanical analysis of the generation of an inlet vortex in a turbojet engine is presented. Methods for the prevention of vortex generation and methods of vortex damping are described. Author

N82-20184# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Turbine Engine Div.
A RETIREMENT-FOR-CAUSE STUDY OF AN ENGINE TURBINE DISK Final Report, 1975 - 1978
Richard J. Hill, Walter H. Reimann, and Jon S. Ogg Nov. 1981 35 p refs
(AF Proj. 3066)
(AD-A109724; AFWAL-TR-81-2094) Avail: NTIS HC A03/MF A01 CSCL 21/5

This report describes a procedure which allows for the retirement of turbine engine disks for actual life exhaustion rather than a statistical minimum limit of a population. The procedure is applied to the third stage turbine disk of the TF33 engine for demonstration purposes. The demonstration included detailed stress and fracture analysis in addition to actual spin pit testing. All spin pit testing was done by the Navy at the Naval Propulsion Center. The effort was a technical success but could not be implemented for the TF33 engine for logistic reasons. Author (GRA)

N82-20185# Garrett Corp., Phoenix, Ariz. Pneumatic Systems Div.
DUALCHANNEL FUEL CONTROL PROGRAM, PHASE 2 Final Report, Apr. 1978 - Aug. 1980
John Itamoto Adelphi, Md. HDL Aug. 1981 81 p refs
(Contract N00019-78-G-0288)
(AD-A108715; Rept-41-2710A; HDL-CR-81-288-1) Avail: NTIS HC A05/MF A01 CSCL 21/5

This report presents the results of a program conducted by Garrett to investigate a dual-channel fuel control for gas turbine engines which could be used in military ground vehicles. The program presents a control system with requirements that are deemed necessary to provide a military gas turbine-powered vehicle with battlefield survivability and minimal restriction on the capability of completing the vehicle mission. This study showed that a parallel dissimilar technology backup control was the desirable approach and that fluidics was the ideal technology to perform this function due to its low cost, reliability, immunity to radiation, and ability to perform computation and logic commensurate with the requirements of achieving mission completion with no degradation in the vehicle's battlefield survivability. GRA

N82-20186*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A TRANSLATIONAL VELOCITY COMMAND SYSTEM FOR VTOL LOW SPEED FLIGHT
Vernon K. Merrick Mar. 1982 30 p refs
(NASA-TM-84215; A-8825; NAS 1.15:84215) Avail: NTIS HC A03/MF A01 CSCL 01C

A translational velocity flight controller, suitable for very low speed maneuvering, is described and its application to a large class of VTOL aircraft from jet lift to propeller driven types is analyzed. Estimates for the more critical lateral axis lead to the conclusion that the controller would provide a jet lift (high disk loading) VTOL aircraft with satisfactory 'hands off' station keeping in operational conditions more stringent than any specified in current or projected requirements. It also seems likely that ducted fan or propeller driven (low disk loading) VTOL aircraft would have acceptable hovering handling qualities even in high turbulence, although in these conditions pilot intervention to maintain satisfactory station keeping would probably be required for landing in restricted areas. Author

N82-20187*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DESIGN CRITERIA FOR FLIGHTPATH AND AIRSPEED CONTROL FOR THE APPROACH AND LANDING OF STOL AIRCRAFT
James A. Franklin, Robert C. Innis, Gordon H. Hardy, and Jack D. Stephenson Mar. 1982 98 p refs
(NASA-TP-1911; NAS 1.60:1911; A-8645) Avail: NTIS HC A05/MF A01 CSCL 01C

A flight research program was conducted to assess requirements for flightpath and airspeed control for glide-slope tracking during a precision approach and for flare control, particularly as applied to powered-lift, short takeoff and landing (STOL) aircraft. Ames Research Center's Augmentor Wing Research Aircraft was used to fly approaches on a 7.5 deg glide slope to landings on a 30 X 518 m (100 X 1700 ft) STOL runway. The dominant aircraft response characteristics determined were flightpath overshoot, flightpath-airspeed coupling, and initial flightpath response time. The significant contribution to control of the landing flare using pitch attitude was the short-term flightpath response. The limiting condition for initial flightpath response time for flare control with thrust was also identified. It is possible to define flying-qualities design criteria for glide-slope and flare control based on the aforementioned response characteristics. M.D.K.

N82-20188*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SELF-TUNING REGULATORS FOR MULTICYCLIC CONTROL OF HELICOPTER VIBRATION
Wayne Johnson Mar. 1982 50 p refs
(NASA-TP-1996; NAS 1.60:1996; A-8719) Avail: NTIS HC A03/MF A01 CSCL 01C

A class of algorithms for the multicyclic control of helicopter vibration and loads is derived and discussed. This class is characterized by a linear, quasi-static, frequency-domain model of the helicopter response to control; identification of the helicopter model by least-squared-error or Kalman filter methods; and a minimum variance or quadratic performance function controller. Previous research on such controllers is reviewed. The derivations and discussions cover the helicopter model; the identification

Two turbine cascades were tested at simulated engine conditions to provide a data base of endwall heat transfer data. This data base is intended to be sufficiently complete to provide verification data for refined computational models developed to predict first-stage stator endwall heat transfer in advanced turbine engines. A linear, two dimensional cascade provided the bulk of the data. This cascade provided data to separate the effects of exit Mach number, exit Reynolds number, inlet boundary layer thickness, gas-to-wall temperature ratio, inlet pressure gradients, and inlet temperature gradients. In addition, adiabatic wall temperature and inlet turbulence intensity data are available for the linear cascade runs. A computerized data base was generated. This data base, with its associated software management system, provides the user with relatively easy access to the vast amount of data generated. A full annular, three dimensional cascade was used to acquire data for identifying the radial pressure gradient effects. Tests in the annular cascade were run over a wide range of exit Mach and Reynolds number and gas-to-wall temperature ratios, all at levels typical of advanced engines. A user's manual is presented. R.J.F.

N82-21202# Department of Energy, Bartlesville, Okla. Energy Technology Center.
THERMODYNAMICS OF ORGANIC COMPOUNDS Final Technical Summary Report, 1 Oct. 1980 - 30 Sep. 1981
N. K. Smith, B. E. Gammon, and William D. Good 1981 24 p refs
(Grant AF-AFOSR-ISSA-00013-81; AF Proj. 2308)
(AD-A110430; AFOSR-82-0023TR) Avail: NTIS HC A02/MF A01 CSCL 21/5

The research effort continues to be focused on high density/high energy hydrocarbons. In cooperation with researchers at Wright-Patterson Air Force Base, heats of combustion are measured for constituents of current ramjet fuels and for finished fuels; meanwhile, pure hydrocarbons are synthesized for heat-of-combustion measurement whose unusual steric or strain energies may contribute to design of high energy/high density fuels of the future. Four pure hydrocarbons studied were selected among the alkylnaphthalenes and indans that may exhibit unusual steric energies. One unusual hydrocarbon, with very high density and a cage-like molecular structure, was also studied. This substance is undergoing preliminary testing as an experimental fuel. Synthesis and purification of hydrocarbons for future study are in progress at Oklahoma State University. New equipment and procedures were developed for application of the differential scanning calorimeter on measurements of heat capacity of fuels and their constituents. Preparation is underway to study the heat of combustion of several special liquid hydrocarbon fuels. GRA

N82-21203# United Technologies Research Center, East Hartford, Conn.
RESEARCH ON TURBINE ROTOR-STATOR AERODYNAMIC INTERACTION AND ROTOR NEGATIVE INCIDENCE STALL Final Report, Mar. 1979 - Nov. 1981
R. P. Dring, H. D. Joslyn, L. W. Hardin, and J. H. Wagner Wright-Patterson AFB, Ohio AFWAL Nov. 1981 107 p refs
(Contract F33615-80-C-2008; AF Proj. 3066)
(AD-A110341; UTRC/R81-915048; AFWAL-TR-81-2114) Avail: NTIS HC A06/MF A01 CSCL 20/4

The aerodynamic interaction between the rotors and stators of a large scale axial turbine stage have been studied experimentally. The data included measurements of the time averaged and instantaneous surface pressures and surface thin film gage output on both the rotor and stator at midspan. The data also included measurement of the stator suction and pressure surface time averaged heat transfer at midspan. The data was acquired with rotor-stator axial gaps of 15% and 65% of axial chord. The upstream potential flow influence of the rotor on the stator was seen as well as the downstream potential flow and wake influences of the stator on the rotor. The second phase of the program was an investigation of the nature of the full-span steady flow over the rotor with incidence varying up to negative incidence stall. Full-span pressure distributions and surface flow visualization were acquired over the entire range of incidence. The data indicated separation-free flow and large radial flows on the pressure surface in the vicinity of design incidence. GRA

N82-21204# Rolls-Royce Ltd., Derby (England). Aero Div.
COATINGS IN THE AERO GAS TURBINE
R. H. Wedge and A. V. Eaves 1980 12 p ref
(PNR-90049) Avail: NTIS HC A02/MF A01

The types of sprayed coatings used are defined, and coating requirements for each section of the gas turbine engine are discussed. Main problem areas are defined as hammer wear at compressor blade (snubber) abutment faces, and turbine blade shroud abutment faces; fretting wear particularly of compressor blade and vane roots rubbing and vane roots rubbing and sliding wear in various applications; the requirement to maintain clearances in gas path seals; and the effects of overheating and thermally cycling turbine parts, particularly rotor blades. The need to restore deliberately overmachined and accidentally overmachined parts is also discussed. Factors to be considered in coating selection are described with particular reference to the application requirements, the types of coating that might be used, and coatings that have proved to give the best results. The relationship between coating performance and cost effectiveness is illustrated with examples. Author (ESA)

N82-21205# Rolls-Royce Ltd., Derby (England).
PROCESS DEVELOPMENT AND EVALUATION OF GAS TURBINE ENGINE COMPONENTS IN IMI 829
R. M. Duncan (IMI Kynoch Ltd.), R. E. Goosey (IMI Kynoch Ltd.), R. H. Jeal, and P. J. Postans 1980 12 p refs
(PNR-90050) Avail: NTIS HC A02/MF A01

Measurements of basic physical properties and mechanical property evaluation of a range of typical gas turbine parts were performed on this titanium alloy (Ti-Al-Sn-Zr-Nb-Mo-Si). It is a near-alpha alloy. It has a density of 4.54 g/cu cm and the alpha + beta/beta transformation temperature is nominally 1015 C. Tensile tests of disk and ring forgings show that: at 20 C the 0.2% proof stress is 30 MPa lower than for IMI 685, but both alloys have similar strength at 540 C. Tensile strength is unaffected by forging route and microstructure, but tensile ductility tends to improve as the grain size decreases. The test results show some scatter but at 20 C the average elongation is 13% with the finest grain size and 8% for the coarsest grain size, and at 540 C the elongations are 15% and 11%, respectively. Creep strength is 20 C superior to IMI 685. Fracture toughness is similar to IMI 685 as are crack growth rates. Author (ESA)

N82-21206# Rolls-Royce Ltd., Derby (England).
THE TESTING AND APPROVAL OF AIRCRAFT ENGINE MOUNTED ACCESSORIES
D. S. Pearson 1980 21 p ref
(PNR-90051) Avail: NTIS HC A02/MF A01

Measurement techniques, data assessment criteria, physical interpretation and laboratory simulation methods applicable to accessory vibration testing are reviewed. The inadequacies of endurance approval testing of accessories by applying undirectional single frequency excitation to simulate engine conditions at a particular shaft speed are shown. A measurement and assessment technique is described which recognizes the effect of multifrequency vibration in three planes. An experimental specification for accessories, based on the technique, is outlined. Case histories of vibration induced accessory failure are cited. Author (ESA)

N82-21207# Rolls-Royce Ltd., Derby (England).
DEVELOPMENTS TO IMPROVE THE NOISE AND COMBUSTION EMISSIONS ON THE FOKKER F28 AIRCRAFT AND ITS ROLLS-ROYCE RB183-555 ENGINES. SECTION 1: DEVELOPMENT OF THE NEW INTERNAL 10-LOBE MIXER
S. L. Sarin (Royal Netherlands Aircraft Factories Fokker), K. Goddard, and N. J. Wilson 1981 15 p
(PNR-90061) Avail: NTIS HC A02/MF A01

Theoretical and practical aspects of exhaust mixer design for turbofan engines are discussed. The effects on fuel consumption and noise reduction of annular and multilobed internal mixers are compared. The production version of a multilobed mixer is described. The lobed mixer reduces total noise by 5.75 dB A and fuel consumption by 4%. The development trends of exhaust mixers, with particular reference to high bypass ratio engines are also discussed. Author (ESA)

N82-21208# Rolls-Royce Ltd., Derby (England).
ENGINES FOR AIR TRANSPORT
A. G. Newton 1981 52 p
(PNR-90066) Avail: NTIS HC A04/MF A01

The status and trends of commercial aircraft transportation systems were reviewed. The characteristics and specific consumption of aviation fuel are emphasized. It is shown that in the next 15 years the fuel consumption of current large fan engines can be reduced by 15%. The quality of fuel will deteriorate relative to today, which will place greater demands on engine design. Further improvements in fuel economy using engines designed for lower specific thrust appear feasible. The development of a full authority digital control system and its effects on fuel consumption are also discussed. Author (ESA)

N82-21209# Rolls-Royce Ltd., Derby (England).
ALLOWING FOR THE WALL BOUNDARY LAYER IN A STAGE OF AN AXIAL COMPRESSOR
N. S. Berestneva, N. A. Kocal, F. G. Kentsevich, and Y. G. Otsechkin Jan. 1981 9 p refs Transl. into ENGLISH from Samoletostr. Tekh. Vozdush. Flota (USSR), no. 43, 1978 p 51-54 In ENGLISH and RUSSIAN
(PNR-90067; Trans-15546; TLT-00815) Avail: NTIS HC A02/MF A01

The geometric characteristics of the tested stage and the grid parameters are given. The coefficient of adiabatic pressure of the stage is taken as 0.26 at a coefficient of consumption of 0.447. The stage is a model of the initial stage of a high pressure compressor. The operation of the stage in the calculated field of input speeds leads to a 3.5 % increase in its maximum efficiency with no influence upon the limit of its operational stability. Author (ESA)

N82-21210# Rolls-Royce Ltd., Derby (England). Noise Technology Div.
THE ROLLS ROYCE ROLE IN AIRCRAFT NOISE REDUCTION
M. J. T. Smith 8 Sep. 1981 17 p refs Submitted for publication
(PNR-90069) Avail: NTIS HC A02/MF A01

Jet turbomachinery, pressure, combustion and aerodynamic noise sources are discussed. General features of reasearch organization and current projects (RB2U-524, RB711-535, RJ500) are outlined. Engine development costs often lead to an emphasis on adopting existing products to new and altered airframes. Author (ESA)

N82-21211# Rolls-Royce Ltd., Derby (England). Dept. of Engineering.
THE MECHANICAL TESTING OF COMPRESSORS AND TURBINES FOR AIRCRAFT GAS TURBINE ENGINES
D. Norris 1981 12 p
(PNR-90070) Avail: NTIS HC A02/MF A01

Ten different engine types, including the RB211 family of engines, and both civil and military applications, are considered. Overspeed, fatigue, bird ingestion, and blade containment are described. Author (ESA)

N82-21212# British Aerospace Aircraft Group, Weybridge (England).
SIMULATION OF TURBOFAN ENGINE MODELS IN THE WEYBRIDGE LOW SPEED WIND TUNNEL
R. F. H. Storey Jun. 1981 7 p
(BAe-Inform-Note-46) Avail: NTIS HC A02/MF A01

A control arrangement for the gas supply to a low speed wind tunnel is suggested. Clean dry nitrogen gas at up to 1500 lb/sq in and 90 C is supplied from a mobile dispenser at 4.2 lb/sec. Gas pressure is reduced to 400 lb/sq in and drives two model turbofan engines. The flow from the dispenser into the models is controlled by servovalves operating hydraulically from pressure transducer signals. Materials and supply sources are listed. Author (ESA)

N82-21213# Aeronautical Research Labs., Melbourne (Australia).
THE STABILITY OF PORTABLE BRIDGES CARRIED ON SLINGS BENEATH HELICOPTERS
N. Matheson Jan. 1980 56 p refs
(ARL/Aero-Rept-154; AR-001-787) Avail: NTIS HC A04/MF A01

Information available concerning the operation of helicopters carrying airportable bridges is reviewed. In addition, a series of wind tunnel tests were made with 1/15 scale models to determine the maximum safe speed for a helicopter carrying two different class 16 bridges, a 16 m (52 ft) clear span, and a 22 m (72 ft) raft, separately on a single hook. The tests indicated that the 16 m (52 ft) bridge can be carried safely at speeds up to 65 knot on a 16 m (53 ft) cable, provided it was slung 0 deg nose up in the static condition, and two small flat fins were attached to the aft end. The raft was carried in two loads, A and B, because of weight limitations. Load A, which consisted mainly of deck bases and accessories, can be safely carried without fins at speeds up to 60 knot on a 16 m (53 ft) cable provided it was rigged 1 to 2 deg nose up. Load B, which consisted of four ramps and four articulators, can also be carried at 60 knot, but small flat fins were required and it had to be slung 5 deg nose up and carried on a 10 m (33 ft) cable. S.L.

N82-21214# Princeton Univ., N. J. Dept. of Mechanical and Aerospace Engineering.
DIGITAL COMMAND AUGMENTATION FOR LATERAL-DIRECTIONAL AIRCRAFT DYNAMICS Annual Technical Report, 1 Feb. 1979 - 31 Jan. 1980
David Atzhorn Arlington, Va. ONR May 1981 198 p refs
(Contract N00014-78-C-0257; NR Proj. 300-003)
(AD-A110274; MAE-1511; ONR-CR-300-003-2) Avail: NTIS HC A09/MF A01 CSCL 01/2

Linear-quadratic sampled-data regulator theory is used to design several Type 0 and Type 1 control laws for lateral-directional aircraft dynamics. Control structures are defined for singular command inputs and for control rate outputs; the former allows for precise following of a command whose integral appears in the state vector, while the latter uses both a difference approximation and the Tustin transform to characterize control rate in the discrete-time domain. Type 0 controllers with control rate restraint and equivalent Type 1 controllers are implemented in a microprocessor-based digital flight control system, and flight tests are conducted using Princeton University's Variable-Response Research Aircraft. The control system, entitled CAS-4, offers four combinations of control: direct (unaugmented) control, Type 0 control with both roll rate/sideslip angle and roll rate/lateral acceleration command combinations, and Type 1 control with roll/sideslip angle command. Ground-based hybrid simulation and flight test results show that major closed-loop response features are unaffected by the choice of sampling rate when sampled-data regulator theory is used. Consequently, much lower sampling rates than would normally be expected can be used when control laws are derived in this manner. GRA

N82-21215# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).
INFLUENCE OF STRAKES ON COEFFICIENTS OF LONGITUDINAL STABILITY Thesis - Tech. Univ., Munich [EINFLUSS VON STRAKES AUF DIE BEIWERTE DER LAENGSBEWEGUNG]
Gerhard Wolfrum 20 Dec. 1979 190 p refs In GERMAN
(MBB-FE-122/S/PUB/22) Avail: NTIS HC A09/MF A01

In a subsonic wind tunnel the influence on the longitudinal stability of seven different strakes mounted on five basic wings was measured. Size of the strake and lift are directly related, while the aerodynamic drag is determined by the basic wing. The importance of pitch is influenced by the strake in relation with the lift. The efficacy of right strakes on more or less swept back wings against buffeting is particularly strong in the subsonic area. In general, strakes do not influence substantially the outline of the aerodynamic configuration, but their size remains the most important single parameter to obtain longitudinal stability. Author (ESA)

N82-21216# Royal Aircraft Establishment, Farnborough (England).
SOME REMARKS ON BUFFETING
D. G. Mabey Feb. 1981 35 p refs Presented at Von Karman Inst. for Fluid Dyn. Lecture Ser. on Unsteady Airloads and Aeroelastic Probl. in Separated and Transonic Flows, Brussels, 10 Mar. 1981
(RAE-TM-Struct-980; BR78530) Avail: NTIS HC A03/MF A01

Buffeting is defined as the structural response to the aerodynamic excitation produced by separated flows. The aerodynamic excitation produced by bubbles, vortices and transonic flows is discussed. Different buffeting criteria for the wings of fighter and transport aircraft are developed. Methods of predicting the onset and severity of buffeting are reviewed. Typical examples are discussed, in which improvements in wing buffeting are compared with changes in mean force measurements. Buffeting measurements on ordinary models in a cryogenic wind tunnel are analyzed. The measurements confirm that cryogenic tunnels can separate Reynolds number and aeroelastic effects. The frequency parameter must be correct on the model if the aerodynamic excitation does not have a flat spectrum, as at vortex breakdown on a slender wing. Author (ESA)

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VORTEX SHEETS
- The vortex flow field generated by a hovering helicopter A82-26227

Many aircraft accidents involve tail rotor strikes. Replacing the helicopter fin with an airfoil-shaped cross-section ring provides greater safety, increases thrust and lowers noise. Full-scale ground, wind-tunnel, and feasibility flight testing shows that the rotor blade tip vortices educt air around the guard ring by external mixing to produce increased thrust for the same power input and a larger maximum available value. Acoustic data under static thrust conditions show reduced noise levels up to eight dBA by the use of the thrust ring and lowered operating tip speeds. Improved aircraft handling qualities are also indicated by feasibility flight test data. Applying the thrust ring to the main rotor requires a light ring and a relatively small rotor. Lighter transmissions, smaller antitorque devices and a compact construction would be pluses. Negatively, there would be problems with the weight of the ring and unknown factors in aerodynamics, controllability, and stability. C.D.

A82-26379 **The general purpose research rotor - Design features and considerations.** A. Z. Lemnios and R. Jones (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980. Paper.* 16 p. 6 refs.

The General Purpose Research Rotor (GPRR) involves an in-depth preliminary design of a configuration which has multifunctional capabilities that can be used to investigate several different optional configurations with minor modifications to the basic structure. It is pointed out that, even with a number of advancements made with respect to airfoil design and tip shapes, significant problems still exist in the development of helicopter rotors. In particular, a better understanding is required of the rotor parameters which affect performance, vibration, noise, and stability. The GPRR provides a configuration which is ideally suited to study the sensitivity of these characteristics to configurational changes. The GPRR is a four-bladed configuration with each blade fabricated from composite materials. Attention is given to a conceptual study, a parametric study, a feasibility study, the evaluation of a selected configuration, and aspects of technological payoffs. G.R.

A82-26380 **Design of higher harmonic control for the ABC.** J. O'Leary and W. Miao (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 11 p. 9 refs.

Attention is given to the vibration characteristics of the ABC helicopter, ABC vibration with higher harmonic control (HHC), an active vibration controller, and the implementation of HHC on the ABC XH-59A helicopter. It is found that HHC is ideal for the ABC helicopter because of its large operational range of rotor speeds and natural interrotor load cancellation. It is feasible to achieve a 90% reduction of vibration through HHC. HHC requirements are in the range of 0.5 to 2 deg depending upon the harmonic frequency of the input. HHC does not alter the interrotor cancellation characteristic of the ABC rotors. The existing interrotor cancellation on the ABC helicopter makes the HHC application easier. G.R.

A82-26381 **CH-46 and CH-47 composite rotor blade lightning protection testing.** G. Heiderscheidt and J. Sarro (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 8 p.

A helicopter composite rotor blade suited to the lightning environment must be able to withstand a single strike of 200,000 amps and multiple strikes of 50,000 amps or less with only minor damage. The main element in the CH-46 and CH-47 lightning protection system is the titanium nosecap. All metal parts of the blade are either shielded by it or conduct to it. A conductive path leads from the cap to the metal rotor hub and then to the other metal sections of the aircraft. High-voltage long-arc tests involved 17 strikes averaging between 10,000 and 12,000 amps peak. Only minor damage occurred, including pitting and loosening of the top bonding strap. Swept-stroke tests involved 100 amp continuing current with 50,000 amp restrike swept from one blade to the next. No significant damage was seen. High current tests, including three 200,000 amp artificial lightning strikes, resulted in bond strips being blown away but no serious damage. C.D.

A82-26382 **A preliminary investigation of Individual Blade-control Independent of a Swashplate.** K. F. Guinn (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 9 p. 11 refs.

A description is presented of the Individual Blade-control Independent of a Swashplate (IBIS) system, taking into account system components and their function. The IBIS fly-by-light control system is a unique concept for controlling the rotor blades of a helicopter of V/STOL aircraft. The concept stresses simplicity and utilization of integrated subsystems which inherently increase reliability while reducing weight and cost. Secondary flight control actuators are not needed with the fly-by-light system since secondary functions such as autopilot and SAS may be implemented simultaneously through the primary control actuators. By proper use of signal limiting, secondary control authority and rate limits may be provided by electronic circuitry instead of by secondary actuators with velocity and stroke limitations. G.R.

A82-26383 * # **Selection of some rotor parameters to reduce pitch-roll coupling of helicopter flight dynamics.** R. T. N. Chen (NASA, Ames Research Center, Moffett Field, CA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadephia, PA, Oct. 22-24, 1980, Paper.* 19 p. 21 refs.

The results of a study conducted to investigate further a means of choosing primary rotor parameters to reduce the coupling of longitudinal and lateral flapping in hover and in forward flight are presented. The rotor parameters included - flapping hinge offset, flapping hinge restraint, pitch-flap coupling, and blade Lock number - are known to influence the agility, stability, and operational safety of helicopters. Effects of the nonuniform downwash model of White and Blake on the blade flapping motion are examined, and the theoretical calculation is then correlated with experimental test data. The condition for achieving perfect decoupling of the flapping response due to aircraft pitch and roll rates, which was previously obtained for a hovering rotor, is evaluated in forward flight. The results show that negligible coupling is achieved in forward flight; moreover, there is the additional benefit of a slight reduction in the coupling of the roll rate to coning. It is also indicated that the values of the rotor parameters chosen according to the decoupling condition are moderate and that the flapping motion is stable with the parameters chosen. (Author)

A82-26384 **CH-46 fiberglass rotor blade repair program.** N. Caravasos (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadephia, PA, Oct. 22-24, 1980, Paper.* 8 p.

This paper discusses the importance of field repair capability of fiberglass rotor blades at the lowest maintenance level. An overview of validated repairs in a controlled environment is presented, including fatigue testing as well as actual repairs - out of the laboratory and in the field by Navy and Marine Corps mechanics. Substantial cost improvement between fiberglass and metal blades was realized because of improved reliability of fiberglass blades requiring less maintenance actions. (Author)

A82-26385 **A survey of U.S. Army helicopter main and tail rotor blade obstacle strikes.** L. T. Burrows (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 8 p.

A description is presented of the results of a survey of main and tail rotor blade obstacle strikes which resulted in damage-causing mishaps. The occurrence of the considered mishaps are partly the consequence of an increased employment of terrain flying tactics. Such tactics are necessary to improve the chances for the survival of helicopters in the mid to high intensity combat environment. In the majority of the mishaps analyzed, the objects most often struck were trees, branches, bushes, or other vegetation. The aircraft considered include the OH-58 Kiowa, the AH-1 Cobra, and the UH-1 Iroquois. Approaches to obstacle strike tolerance are also discussed. G.R.

A82-26386 **The YAH-64A composite flexbeam tail rotor.** D. Banerjee, R. E. Head, R. Marthe (Hughes Helicopters, Inc., Culver

City, CA), and M. Ploudre (U.S. Army, Manufacturing Technology Branch, St. Louis, MO). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 12 p. 9 refs.

A new composite flexbeam tail rotor is being fabricated for the YAH-64 Advanced Attack Helicopter. This rotor builds on the aerodynamic/dynamic and composites manufacturing technology which has been developed over the past several years for hingeless tail rotors. The design of a structurally and dynamically bearingless tail rotor design requires the solution of a number of problems. The problems are discussed along with the approaches developed for their solution. Attention is given to the prototype rotor, tail rotor design refinements, and manufacturing techniques. The flexbeam is considered along with the hub, the pitch case, the blade, the rotor dynamics, and certain key parameters. G.R.

A82-26387 * # **Performance improvements with the free-tip rotor.** R. H. Stroub (NASA, Ames Research Center, Moffett Field, CA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 9 p.

A new rotor configuration called the free-tip rotor was investigated for its potential to improve helicopter forward-flight performance characteristics. This rotor differs from a conventional rotor only in the blade tip region. Free tip is self-adjusting in pitch with respect to the rest of the blade. With this capability, the resulting pitch motion generated a more uniform airload distribution around the azimuth. Computer math models were used to compare performance characteristics of the free-tip rotor with those of a conventional rotor operating at flight speeds from 130 to 160 knots. The free-tip rotor is shown to improve cruise L/DE by at least 22%. (Author)

A82-26388 # **Operational experience with the fiberglass rotor blade.** R. E. Yeend (U.S. Naval Air Systems Command, Arlington, VA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 15 p.

A recently introduced fiberglass rotor blade (FRB) for the Navy/Marine Corps H-46 helicopters resulted in greatly increased mean blade flight hours between maintenance actions, removal to depot, and failure as compared to metal rotor blades. Aircraft flying qualities and performance characteristics were essentially unchanged from those obtained with metal rotor blades. No return to depot was required during reliability demonstration tests. Operational experience showed that in 82,000 total blade flight hours, involving over 500 FRB's, none had to be returned to depot for repair, compared to 464 metal blades in that time span. Of the 18 FRB's that were damaged, 15 were returned to service at the field activity level. Inherent failure that occurred in three blades is not expected to occur in production blades. Problems currently under investigation are titanium sparking during night flight, blade retention pin wear due to ingestion of sand, and corrosion of the lightning protection screen. C.D.

A82-26389 **Design of a composite main rotor blade spar for fabrication by tubular braiding.** M. L. White (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 7 p. 8 refs. Army-sponsored research.

Mechanical tubular braiding has been shown to be a viable spar manufacturing process in a program which included preliminary design of an improved main rotor blade for the OH-58 helicopter. The blade incorporates an advanced aerodynamic shape and has as its primary structural member a Kevlar 49/epoxy spar fabricated by braiding. Achievement of an analytically acceptable blade and spar design meeting critical structural and dynamic requirements was not hindered by braiding process constraints. Mechanical property tests of flat panels and spar sections exhibited excellent correlation with analytical predictions, substantiating the applicability of normal composite laminate analysis methods and the validity of the specific design. Ballistic testing of spar sections demonstrated superior containment of structural damage compared to composite spars produced by more conventional methods. Manufacturing cost estimates predict a price reduction of 1/3 for the braided spar over a similar S-glass/epoxy spar fabricated by orthodox, low-cost technology for an OH-58 blade of identical external shape. (Author)

A82-26390 **Sikorsky tail rotor - 1980: Advanced manufacturing and quality control techniques.** G. Wehnert (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 8 p.

A new lay-up design for the unidirectional graphite/epoxy spar of the tail rotor blade assembly in the Sikorsky BLACK HAWK aircraft simplifies manufacturing while changing none of the spar's physical and structural characteristics. The currently used 321 torpedo plies are replaced by 213 unidirectional one-piece plies laid up alternately at plus or minus 5 degrees to the horizontal. Spar yield is also improved by using press grade graphite with lower epoxy resin content, resulting in more uniform flow characteristics during molding. Consequently, less debulking in the thicker areas is required, porosity is reduced and the cure cycle is simplified because of more repeatable gel characteristics. The quality control employs a fully automated ultrasonic inspection and back-up inspections that distinguish between voids and inclusions on the one hand and porosity on the other with the resultant improved yield. C.D.

A82-26391 **SH-60B Seahawk automatic blade fold system.** C. V. Toner (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 11 p.

An automatic electromechanical blade fold system has been successfully tested as part of the U.S. Navy SH-60B Seahawk antisubmarine helicopter development program. Originally the blade fold systems had been hydraulically powered. However, for the SH-60B program a decision was made to change to an electrically powered system, because it promised inherently higher reliability and potentially lighter weight in a simpler system. Attention is given to system requirements, air vehicle reliability, a system definition, the blade fold, the lag dampers, aspects of pitch lock design, the blade retention bearing, the initial blade fold design, questions of blade unlocking, the fold actuator, the fold hinge detent, lock pin extraction, lock pin sequencing, and questions of fold actuator isolation. G.R.

A82-26392 **The impact of missions on the preliminary design of an ABC rotor.** G. de Simone, R. S. Blauch, and R. A. Fisher (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 19 p. 8 refs.

A number of studies have shown the suitability of the ABC rotor in a wide range of applications which require combinations of high speed flight and low speed agility and efficiency. Studies related to two of the envisaged applications are discussed. An advanced rotor has been derived for a cruise design point and a hover design point. Attempts have been made to chart the impact of airfoils, taper, and twist on the performance of an advanced rotor and a baseline XH-59A geometry rotor. Design trends using the two rotor data bases have been generated for a troop assault mission (high cruise speed requirement) and for an observation mission (high hover time required). G.R.

A82-26393 **Main rotor hub electromagnetic signature reduction.** J. Shostak (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA) and J. Carver (Rockwell International Corp., Tulsa, OK). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 10 p.

A main rotor hub cover was developed to reduce the electromagnetic (EM) signatures of the Army AH-1G/S helicopters' main rotor hub. The signatures addressed in the rotor hub cover design were the radar cross section (RCS), infrared radiation (IR) and visual, with emphasis being placed on RCS reduction. A detailed discussion of the main rotor hub cover development program and its subsequent RCS testing are presented in this paper. The stated program goals established the criteria from which the hub cover evolved. Careful consideration was given to the selection of materials and the cover design for optimization of the electromagnetic signature reduction. Static RCS signature measurements were performed on the rotor hub cover as were subsequent in-flight RCS measurements on the entire helicopter equipped with and without the hub cover. The in-flight

Society for the Advancement of Material and Process Engineering, 1981, p. 134-149. Contract No. F33615-79-C-5038.

Progress towards the realization of resins for field repairs of composite materials using temperatures in the ranges 180-200 F and 300 F are reported. A low moisture absorption, two-part epoxy system with commerically available components and good environmental durability was indicated in a screening process, and the epoxy novolac, DEN 438 cured with isophorone diamine was selected for development. Although slow cure at room temperature was possible, heat curing at 160 F was investigated for rapid turnaround possibilities. High and lower temperature cure cycles with aluminum-composite double strap bonds were employed in a series of bond and strength tests. Sustained stress induced negligible reductions in bond strengths, whereas moisture absorption did cause failures at the strap surfaces. Bond strengths remained steady after 500 hr aging at 300 F. A necessity of fabricating a room temperature primer is mentioned. M.S.K.

A82-27414 **Compatibility of 350 deg curing honeycomb adhesives with phosphoric acid anodizing.** E. E. Peterson, D. B. Arnold, and M. C. Locke (Boeing Commercial Airplane Co., Seattle, WA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 177-188. 8 refs. USAF-supported research.

Results of an investigation of the relative mechanical properties and environmental durability of square edge metal/metal honeycomb bonded panels with skins processed with phosphoric acid anodize (PAA) and Forest Products Laboratory (FPL) are reported. The PAA process conditions were varied on metal-to-metal shear strength tests and environmental durability was examined, using cyclic room temperature to -67 F conditions. Peel strengths increased at low temperatures and failure analysis revealed no specimen failure interfacially between oxide and primer, while moderate to good filleting to the core enhanced peel strength. Test specimens were all aluminum alloys, and environmental failures occurred between the adhesive and the aluminum core. Finally, variation in the PAA process had negligible effect on the lap-shear strength or the fracture toughness of metal-to-metal bonded joints. M.S.K.

A82-27415 **Characterization of composition variations in a structural adhesive.** K. G. Kibler (General Dynamics Materials Research Laboratory, Fort Worth, TX). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 189-202. 7 refs. Contracts No. F33615-80-G-0007; No. F33615-80-G-0002; No. F33615-80-G-0003.

Attempts to establish correlations between compositional changes, processability, and structural-environmental performance of the 350 F cure structural adhesive RB398 are reported. The program was intended to define material acceptance specifications in terms of composition, formulation, and cure limits as part of the F-16 Technology Modernization Program. RB398 was tested in multiple variations of constituents in physiochemical, performance, and processability trials. High performance liquid chromatography was found to be a suitable method for detecting variations in organic constituents at levels which affect processing or performance. M.S.K.

A82-27423 **Composite control tubes.** S. C. Aker and W. G. O. Sonneborn (Bell Helicopter Textron, Fort Worth, TX). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 280-286.

The design and development of composite material push-pull control tubes to replace aluminum tubes in helicopter flight control systems are described. A three-year development and FAA certification program is discussed, which resulted in a weight savings for tubes of approximately 50% relative to current aluminum designs. Reliable and potentially lower cost hardware that will be fielded in the Bell Helicopter Textron Model 214ST transport helicopter has also been developed by the program. Mechanized manufacturing methods for the production of the tubes are described, and it is shown that inventory simplifications for spares can be achieved by two-piece construction of the tubes. D.L.G.

A82-27424 **The design, construction, and performance of composite fuselage components for the Boeing 234 helicopter.** L. J. Marchinski and R. L. Pinckney (Boeing Vertol Co., Philadelphia, PA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 287-297.

The design, construction and structural evaluation of the composite fuel pods for the commercial Boeing 234 helicopter are presented. The all-composite pods are attached to the airframe structure through vibration isolation devices, and are of sandwich shell design employing KEVLAR and graphite fibers. The all-composite cargo floors used in the commercial 234 are also discussed, which, along with the fuel pods, have proved to be less costly, of lower weight, and easily tailored to requirements. D.L.G.

A82-27429 **Engine industry cost considerations for emerging technologies.** M. A. Siegel (United Technologies Corp., Government Products Div., West Palm Beach, FL). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 358-363.

Aspects related to the successful implementation of new technologies in aircraft engines are examined. The present investigation assumes that the benefits other than cost have been established. The cost factors in product selection cover a wide range of influence encompassing the basic cost of the product or part, the development cost, capitalization to produce the part, and operating costs. The ability to accurately calculate these costs frequently determines acceptance of a new concept and its success in service. Attention is given to materials and processes which have paced the growth of the aircraft and aerospace industry. G.R.

A82-27430 **Manufacturing cost trade-studies in avionics.** B. R. Noton (Battelle Columbus Laboratories, Columbus, OH), J. G. Vecellio (Rockwell International Corp., Avionics and Missiles Group, Cedar Rapids, IA), and R. Remski (Honeywell, Inc., Avionics Div., Minneapolis, MN). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 364-379.

It is becoming increasingly important to arrest and reduce costs at all levels of the aircraft system life-cycle. The 'Manufacturing Cost/Design Guide' (MC/DG) Data Development Program for airframes and avionics provides an opportunity for the designer to study a larger number of alternative design configurations for airframes and avionics to achieve the lowest manufacturing cost. The MC/DG man-hour information is presented in basically three forms. These are lowest-cost processes for the designer, manufacturing methods for multiple discrete parts, and multiple manufacturing methods for single discrete parts. Attention is given to major system design parameters, MC/DG section development for electronics fabrication and assembly, electronic cost-drivers, an integrated example utilizing MC/DG formats for electronics, and fabrication and assembly cost-drivers. G.R.

A82-27432 **An evaluation of several polymers for high density humidity PC coatings.** H. E. Frankel, C. Ray, and F. P. Casto (Fairchild Space and Electronics Co., Germantown, MD). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 399-406.

In the evaluation, one of the most severe environments to which military aircraft is subjected is considered. Attention is given to rapidly changing temperatures at seacoast locations, taking into account situations in which the atmosphere may be laden with industrial or fossil fuel by-products. A urethane coating used for printed wiring boards afforded generally excellent protection. However, in connection with more stringent requirements, particularly with regard to rapidity of high-altitude, high-humidity cycling, it became clear that only either a new type of coating or a much thicker urethane coating could provide the required protection. An experiment was, therefore devised to evaluate the single parameters of imperviousness to moisture, taking into consideration six types of coating. The qualifications of the various coatings are discussed. G.R.

A82-27436 **Transition of aerospace adhesive bonding technology from R&D to operational use.** H. S. Schwartz (USAF, Materials Laboratory, Wright-Patterson AFB, OH). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 425-436. 18 refs.

A chronological review is presented of developments in the materials processes and quality assurance aspects of aerospace bonding, and the degree of success in transitioning these developments. Early applications of adhesive bonding technology in aircraft structure exploited intrinsic structural advantages, such as long fatigue life and high stiffness-to-weight ratio. High temperature polymers were later developed for use up to 700 F. Service experience in the 1960s revealed deficiencies in moisture resistance of the epoxy-based adhesive bonding technology for aluminum structures, which led to the development of high durability bonding technology for the aluminum structures in the mid-1970s. Current emphasis is on reliable performance and economical production. D.L.G.

A82-27437 **Correlation of surface characterization of phosphoric acid anodize oxide with physical properties of bonded specimens.** K. K. Knock and M. C. Locke (Boeing Co., Seattle, WA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 445-458. 6 refs.

A82-27446 **Recent developments in materials and processes for aircraft corrosion control.** S. J. Ketcham and J. J. De Luccia (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981. Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 571-582. 10 refs.

The subjects investigated are primarily useful in considerations related to airframes, although the results may also be applicable to electronic equipment. A number of corrosion preventive, water displacing compounds are considered, taking into account their areas of application. It is pointed out that elastomeric sealants are widely used on naval aircraft to seal out the environment. It is anticipated that the use of these sealants will increase in the future due to their ability to accommodate the dynamic loads imposed on aerospace equipment without cracking. Attention is also given to surface treatments for aluminum alloys, and aspects of alloy selection and treatment. Materials under development are related to a water displacing paint, a flexible primer, the development of an aluminum plating process, phase transfer inhibitors, crack arrestment compounds, and powder metallurgy aluminum alloys. G.R.

A82-27509 † **Problems in the automation of the thermal-stress analysis of flight vehicles (Problemy avtomatizatsii teploprochnostnykh issledovanii letatel'nykh apparatov).** I. F. Obraztsov, O. M. Alifanov, V. S. Kuznetsov, V. I. Lopatin, B. M. Pankratov, and I. M. Ukolov. In: Scientific lectures on aviation and astronautics 1980. Moscow, Izdatel'stvo Nauka, 1981, p. 100-110. In Russian.

The paper examines the development of automated data processing systems for the thermal-stress analysis of flight vehicles. A hybrid system for the automated processing of thermal-test data is described, and a block diagram of the system is presented. B.J.

A82-27526 † **Strength of the turbine components of a gas-turbine engine under complex loading and associated problems (Prochnost' detalei turbiny GTD v usloviiakh slozhnogo nagruzheniia i sviazannye s nei problemy).** N. D. Kuznetsov. *Problemy Prochnosti,* Mar. 1982, p. 10-14. In Russian.

The corrosion resistance and cyclic strength of the blading and disks of aircraft gas-turbine engines are discussed with emphasis on the effects of the fabrication and assembly process variables. The currently used methods of blading design analysis are examined and their faults are demonstrated by comparing the calculated and experimentally determined resonances of a disk. It is shown that more accurate techniques of vibration analysis can be developed on the basis of dynamic elasticity equations. V.L.

A82-27641 # **Analysis of side-looking airborne radar /SLAR/ performance in the detection of search and rescue targets.** S. R. Osmer, N. C. Edwards, Jr. (U.S. Coast Guard, Research and Development Center, Groton, CT), and G. L. Hover (Analysis and Technology, Inc., North Stonington, CT). In: International Symposium on Remote Sensing of Environment, 15th, Ann Arbor, MI, May 11-15, 1981, Proceedings. Volume 2. Ann Arbor, MI, Environmental Research Institute of Michigan, 1981, p. 803-810.

Performance detection tests were conducted on two side-looking airborne radar (SLAR) systems to determine the influence certain environment-related and controllable parameters have on SLAR detection of typical search target types. Analysis techniques consisted of binning and plotting the empirical data to compare SLAR detection performance under sets of conditions for demonstrating the influence of the parameters. Environment-related parameters found to influence performance included wind speed and precipitation, and controllable parameters included target size and composition, altitude, antenna polarization and lateral range. D.L.G.

A82-27709 **Optimal target designation techniques.** L. M. Novak (MIT, Lexington, MA). In: Asilomar Conference on Circuits, Systems and Computers, 14th, Pacific Grove, CA, November 17-19, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 108-112. 6 refs. USAF-DARPA-Army-sponsored research.

This paper presents studies of signal processing techniques for achieving optimal autonomous acquisition of stationary targets located in a moderately intense non-homogeneous radar ground clutter background. The process of target acquisition is comprised of three basic functions: (1) target detection, (2) target selection or designation, and (3) re-acquiring the target for tracking. It is the second of these functions, i.e., autonomous designation of a target, that is the subject of this paper. Theoretical analyses and predictions of the probability of correct target designation for two acquisition search methods are presented and compared with results achieved using real radar imagery. (Author)

A82-27714 * **RAMP - A fault tolerant distributed microcomputer structure for aircraft navigation and control.** W. R. Dunn (Southern Colorado, University, Pueblo, CO), J. Johnston, and G. Meyer (NASA, Ames Research Center, Moffett Field, CA). In: Asilomar Conference on Circuits, Systems and Computers, 14th, Pacific Grove, CA, November 17-19, 1980, Conference Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 280-286. 9 refs. Grant No. NAG2-2.

Design methodologies for realizing future high authority autoflight control systems are being investigated, taking into account also the study of distributed microcomputer architectures. Attention is given to the redundant asynchronous microprocessor (RAMP) structure. RAMP comprises a connected network of microcomputers which has as input command and sensor information, and which generates servo information to drive actuators, and thrust linkages. Tolerance to hardware failures is achieved by static redundancy. Results of a failed microcomputer are simply rejected. This is done in lieu of dynamic redundancy wherein the distributed computer system performs real time fault detection and reconfiguration of the system. Attention is given to the RAMP network structure and operation, flight control with parallel asynchronous computers, and intermittent fault tolerance. G.R.

A82-27869 **Applications of adaptive control systems.** P. C. Parks (Royal Military College of Science, Shrivenham, Wilts., England), W. Schaufelberger (Zürich, Eidgenössische Technische Hochschule, Zurich, Switzerland), C. Schmid, and H. Unbehauen (Bochum, Ruhr-Universität, Bochum, West Germany). In: Methods and applications in adaptive control; Proceedings of the International problem, including both off-line and on-line (recursive) algorithms; the control problem, including both open-loop and closed-loop feedback; and the various regulator configurations possible within this class. Conclusions from analysis and numerical simulations of the regulators provide guidance in the design and selection of algorithms for further development, including wind tunnel and flight tests. M.G.

N82-20189# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
DEVELOPMENT OF LONGITUDINAL EQUIVALENT SYSTEM MODELS FOR SELECTED US NAVY TACTICAL AIRCRAFT Final Report, 1 Jan. 1980 - 1 Jul. 1981
David E. Bischoff 1 Aug. 1981 86 p refs
(WF41400000)
(AD-A109488; NADC-81069-60) Avail: NTIS
HC A05/MF A01 CSCL 01/3

Frequency response matching techniques were applied to the longitudinal dynamics of five Navy tactical aircraft: the A-6, A-7, S-3, F-14 and F-18, to obtain equivalent system models of their short period response. The pitch rate transfer function was matched with a first order numerator over second order denominator equivalent system model. Freeing the numerator root (L Alpha) in the matching process resulted in large unrealistic values of the numerator term. The variation in L Alpha was reduced by simultaneously matching the pitch rate and normal acceleration transfer functions with the denominators constrained to be equal. The mismatch parameter associated with aircraft configurations which were not amenable to the first over second order equivalent models could be improved by identifying additional roots in the equivalent model. Correlation of the data with the requirements of MIL-F-8785C was straightforward for both short period damping ratio and time delay. Correlation of the frequency requirements, however, required that the control anticipation parameter definition be modified to represent the maximum rather than the initial pitch acceleration response. Author (GRA)

N82-20190# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Structures and Dynamics Div.
CATEGORIZATION OF ATMOSPHERIC TURBULENCE IN TERMS OF AIRCRAFT RESPONSE FOR USE IN TURBULENCE REPORTS AND FORECASTS Final Report, Jan. 1979 - Feb. 1980
Elijah W. Turner, Jackie C. Sims, and Andy White Nov. 1981 146 p refs
(AF Proj. 7500)
(AD-A109585; AFWAL-TR-81-3058) Avail: NTIS
HC A07/MF A01 CSCL 01/2

This report describes a method of calculating the gust sensitivity of conventional aircraft and presents gust sensitivity values for a total of 69 military and civilian aircraft. Gust sensitivity is presented in terms of the vertical load factor response of aircraft per foot per second discrete gust. The information is intended to permit organizations engaged in the forecasting of atmospheric turbulence to properly take into consideration the capability of particular aircraft to operate safely in various turbulence levels. The basis for calculating the gust sensitivity is the so called 'gust loads formula' which is a single degree of freedom mathematical model of the aircraft excited by a one-minus-cosine shaped wave form of 25 chord wave length. An empirical equation is used to calculate the aircraft normal force coefficient over the subsonic, transonic, and supersonic airspeed range. Author (GRA)

N82-20191# Army Aviation Research and Development Command, St. Louis, Mo.
INTEGRATION OF CONTROLS AND DISPLAYS IN U.S. ARMY HELICOPTER COCKPITS
J. A. Dasaro and C. T. Elliott Nov. 1981 28 p refs
(AD-A109594; USAAVRADCOM-TR-81-E-4) Avail: NTIS
HC A03/MF A01 CSCL 01/4

The U.S. Army has embarked on a digital avionic program with the immediate goal of developing an integrated avionic system which would eliminate all dedicated communication, navigation, and identification (CNI) control and display units (CDU's) from the cockpit. The CNI equipments were viewed as a well defined set whose control and display functions could be integrated at minimal risk. The integrated CDU developed can be used to in-service or developmental aircraft to alleviate space problems, reduce pilot workload, and increase CNI capability. A four-phase effort consisting of design, hardware fabrication, system integration, and testing was established. A cockpit was synthesized for the BLACK HAWK helicopter in which all crew functions were accomplished using multifunction interactive controls and displays. The results of this effort are presented, together with the status of the hardware currently in fabrication and the Army's plans for bench and flight testing. This exploratory effort is called the Army Digital Avionic System (ADAS). GRA

N82-20192*# National Aeronautics and Space Administration, Washington, D. C.
SONIC WIND TUNNEL OF THE INSTITUTE OF FLUID MECHANICS OF LILLE
G. Gontier Mar. 1982 17 p refs Transl. into ENGLISH from La Recherche Aeronautique (France), no. 10, 1949 p 3-9 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76687; NAS 1.15:76687) Avail: NTIS
HC A02/MF A01 CSCL 14E

A 65 hp wind tunnel with a 40 mm by 240 mm airstream is described. This wind tunnel can achieve speeds in the neighborhood of the speed of sound, both subsonic and supersonic. It is useful in studying the transonic bump technique. The test section is 600 mm long. The side walls are made of transparent glass, and both the upper and lower walls are deformable, each through the use of nine jacks with elastic sleeves. So as to avoid condensation, the airstream's temperature is stabilized by an air exchanger at the temperature of the outside air. The first results for supersonic operation, the distribution of Mach numbers within the airstream between the parallel walls, the value of the use factor, and the diffuser's efficiency are all given. B.W.

N82-20193# Sandia Labs., Albuquerque, N. Mex. Dept. of Engineering Science and Mechanics.
METHODS FOR ANALYSIS OF WIND RIPPLE IN WIND TURBINES
R. E. Akins Apr. 1981 59 p refs
(Contract DE-AC04-76-DP-00789)
(SAND-81-7006) Avail: NTIS HC A04/MF A01

Efficient and economical utilization of wind power requires the ability to measure and ultimately predict the effects fluctuations in the incident wind have on a wind turbine. In order to begin to quantitatively assess these effects, experimental techniques were developed to allow analysis of full-scale performance of wind turbines with particular emphasis on the effects caused by turbulence in the incident wind. R.J.F.

N82-20194# Textron Bell Helicopter, Fort Worth, Tex.
ROTORCRAFT FLIGHT SIMULATION COMPUTER PROGRAM C81 WITH DATAMAP INTERFACE. VOLUME 1: USER'S MANUAL Final Report, Jul. - Dec. 1979
James R. VanGaasbeek Ft. Eustis, Va. Army Research and Technology Lab. Oct. 1981 576 p refs
(Contract DAAK51-79-C-0015; DA Proj. 1L1-62209-AH-76)
(AD-A108246; BHT-699-099-111-Vol-1; USAAVRADCOM-TR-80-D-38A) Avail: NTIS
HC A25/MF A01 CSCL 01/3

This report documents the current version in the C81 family of rotorcraft flight simulation programs developed by Bell Helicopter Textron. This current version of the digital computer program is referred to as AGAP80. The accompanying program for calculating fully-coupled rotor blade mode shapes is called DNAM05, and an associated rotor wake program is called AR9102. The AGAP80 version of C81 was developed by adding some analytical features to the AGAJ76 version, and including the ability to generate Data Transfer Files for use by the File Creation Program of DATAMAP. The User's Manual, contains the detailed information necessary for setting up an input data deck and interpreting the computed data. GRA

N82-20195# Singer Co., Binghamton, N.Y. Link Div.
STUDY AND DESIGN OF HIGH G AUGMENTATION DEVICES FOR FLIGHT SIMULATORS Final Report
Gerald J. Kron, Frank M. Cardullo (MIT), and Laurence R. Young Wright-Patterson AFB, Ohio Air Force Human Resources Lab. Dec. 1981 548 p refs
(Contract F33615-77-C-0055; AF Proj. 6114)
(AD-A109127; AFHRL-TP-80-41) Avail: NTIS
HC A23/MF A01 CSCL 05/19

The physiological effects of accelerated flight are considered to contain perceptual information important to vehicle control and contribute to defining flight envelopes accessible to the pilot.

As such, these effects, or acceptable surrogates thereof, must be considered for inclusion within ground-based devices designed to train pilots for their flight mission. This study investigates the physiological effects of accelerated flight within the cardiovascular musculoskeletal, visual, auditory, tactile, and respiratory systems. The study advances conceptual designs of research-oriented devices thought capable of inducing, in the unaccelerated state, the perception of accelerated flight physiological effects. The authors conclude that one of the most important effects impacting vehicle control and successful mission execution is loss of visual acuity under accelerated flight conditions and propose a dual affect matrixed liquid crystal variable transparency visor to replicate this effect. A math model to simulate the effect is also presented. The study contains a bibliography of 277 references pertinent to accelerated flight physiological effects and equivalent simulation device design. The study presents an appendix containing an annotated bibliography of 133 references. Author (GRA)

N82-20339*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

IDENTIFICATION OF MULTIVARIABLE HIGH PERFORMANCE TURBOFAN ENGINE DYNAMICS FROM CLOSED LOOP DATA

Walter Merrill 1982 16 p refs Presented at the 6th IFAC Symp. on Identification and System Parameter Estimation, Washington, D.C., 7-11 Jun. 1982
(NASA-TM-82785; E-1120; NAS 1.15:82785) Avail: NTIS HC A02/MF A01 CSCL 21E

The multivariable instrumental variable/approximate maximum likelihood (IV/AML) method or recursive time-series analysis is used to identify the multivariable (four inputs-three outputs) dynamics of the Pratt and Whitney F100 engine. A detailed nonlinear engine simulation is used to determine linear engine model structures and parameters at an operating point using open loop data. Also, the IV/AML method is used in a direct identification mode to identify models from actual closed loop engine test data. Models identified from simulated and test data are compared to determine a final model structure and parameterization that can predict engine response for a wide class of inputs. The ability of the IV/AML algorithm to identify useful dynamic models from engine test data is assessed. Author

N82-20343# Southampton Univ. (England). Inst. of Sound and Vibration Research.

VIBRATION OF STRUCTURES EXCITED ACOUSTICALLY

B. L. Clarkson *In* AGARD Mod. Data Anal. Tech. in Noise and Vibration Probl. Nov. 1981 p 19-37 refs

Avail: NTIS HC A08/MF A01

The analytical methods available to estimate the response of structures to vibration are developed on the assumption that the structure itself does not change the properties of the incident sound field by any feed back or flutter type mechanism. The normal mode method is used for the majority of the work to estimate the response to any sound field. Special cases considered are jet noise excitation, turbulent boundary layer pressure excitation, and a reverberant field excitation. The alternative traveling wave method is also introduced. J.D.H.

N82-20357*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CRYOGENIC TECHNOLOGY, PART 1

Mar. 1980 273 p refs Conf. held at Hampton, Va., 27-29 Nov. 1979
(NASA-CP-2122-Pt-1; L-13547; NAS 1.55:2122-Pt-1) Avail: NTIS HC A12/MF A01 CSCL 20L

Different engineering problems associated with the design of mechanisms and systems to operate in a cryogenic environment are discussed. The focal point for the entire engineering effort was the design of the National Transonic Facility, which is a closed-circuit cryogenic wind tunnel. The papers covered a variety of mechanical, structural, and systems design subjects including thermal structures insulation systems, noise, seals, and materials. R.J.F.

N82-20358*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CRYOGENIC TECHNOLOGY, PART 2

Mar. 1980 158 p refs Conf. held at Hampton, Va., 27-29 Nov. 1979
(NASA-CP-2122-Pt-2; L-13547; NAS 1.55:2122-Pt-2) Avail: NTIS HC A08/MF A01 CSCL 20L

Proceedings of a conference on the cryogenic technology developed in support of a transonic wind tunnel are given. Papers address tunnel instrumentation and model/sting technology. R.J.F.

N82-20384# Naval Research Lab., Washington, D. C. Space Science Div.

COMPUTER-PROGRAM MODEL FOR PREDICTING HORIZONTALLY AND VERTICALLY POLARIZED VLF ATMOSPHERIC RADIO NOISE AT ELEVATED RECEIVERS Final Report

Francis J. Kelly, J. P. Hauser, and F. J. Rhoads 28 Dec. 1981 22 p refs
(AD-A109446; NRL-8479) Avail: NTIS HC A02/MF A01 CSCL 20/14

A computer program was developed that can predict horizontally and vertically polarized atmospheric radio noise at any altitude or location in the Earth-ionosphere waveguide in the very-low-frequency (VLF) range from 10 to 30 kHz. The new program, HORNS, uses the outputs of two previously written programs, COMPWR and NOISLAN, which predict the vertical electric noise field at the ground. The HORNS program computes all the field components at any altitude using the vertical electric field at the Earth's surface as a basis. Predicted values from several versions of the new model were compared with presently available data. The results are encouraging, but more data are needed to test the model. GRA

N82-20392# Transportation Systems Center, Cambridge, Mass. Research and Special Programs Administration.

TEST PLAN FOR SSR Final Report

Janis Vilcans Washington FAA Oct. 1981 143 p
(AD-A109503; FA-180-PM-81-40; DOT-FAA-RD-81-84; TSC-FAA-81-23) Avail: NTIS HC A07/MF A01 CSCL 17/9

A comprehensive test plan is presented to evaluate the impact of wind and ice loading on the rotation rate stability of a Secondary Surveillance Radar (SSR) antenna used for air traffic control surveillance. Antenna rotation rate variations may introduce errors in the estimate of a position of an intruding aircraft in a passive collision avoidance system used in conjunction with the SSR antenna. The test plan provides a method for determining the statistics of the antenna rotation rate variations. Analytical methods are then presented to assess the effects on CAS performance. The measurement system design, mathematical model development of the antenna system, test data reduction, and analysis programs are presented in detail. Sample calculations of preliminary field data are given and compared with the results obtained from computer simulations. The computer simulations are also intended to predict antenna rotation rate variations at the upper limits of the FAA specified range, which were not generally encountered during normal operations. Author (GRA)

N82-20408# Northrop Corp., Hawthorne, Calif. Aircraft Div.

VORTEX FLOW CORRELATION Final Report, May - Oct. 1980

Gary E. Erickson Wright-Patterson AFB, Ohio AFWAL Jan. 1981 357 p refs
(Contract F33615-80-C-3024; AF Proj. 2307)
(AD-A108725; NOR-80-152; AFWAL-TR-80-3143) Avail: NTIS HC A16/MF A01 CSCL 14/2

Key parameters have been identified which permit correlation of vortex flow simulations in a water tunnel with wind tunnel and flight data. Vortex generation, vortex sheet and core location, and a vortex strength on thin slender wings are accurately represented in a water tunnel due to the insensitivity of separation point location to changes in Reynolds number. The fact that theoretical methods which ignore viscous effects can reasonably predict vortex flow aerodynamics is one indication of the Reynolds number insensitivity of these flow phenomena. For wings and bodies where separation point varies with Reynolds number, the fundamental vortex structure is similar regardless of Reynolds number value since vortices at a distance from the generating surfaces are embedded in essentially irrotational flow. External pressure gradient is an important parameter affecting vortex stability and, although there is yet no theoretical verification that this parameter is the dominant one, vortex burst at higher angles of attack for a given configuration occurs at comparable positions in water tunnels as in wind tunnels and flight. A water tunnel is a powerful diagnostic tool capable of providing

N82-21217# Royal Aircraft Establishment, Farnborough (England). Structures Dept.
THE APPLICATION OF SUBSONIC THEORETICAL AERODYNAMICS TO ACTIVE CONTROLS
H. C. Garner May 1981 84 p refs
(RAE-TR-81060; RAE-Struct-BF/B/0860; BR80082) Avail: NTIS HC A05/MF A01

Aerodynamic forces for wing and control surface motion with general time dependence in linearized subsonic flow were analyzed. The time domain where quasisteady displacement and rate terms are combined with a residual history term is discussed. An accurate calculation procedure is devised, and results are illustrated for a high respect ratio wing at Mach number 0.8 with trailing edge, leading edge and all moving tip controls. Asymptotic behavior at small and large times and individual control characteristics are compared. The quasisteady approximation is established for hinge moments and is analyzed for lift. The rapid lift response to leading edge control and the sluggish lift response to trailing edge control are explained. The forces in the time domain are confirmed by Fourier transform calculations in the frequency domain, which shows the extent to which the range of frequency can be truncated. The control surface motion to produce a known time dependent force is determined. Author (ESA)

N82-21218# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Aircraft Div.
VIBRATION QUALIFICATION OF EXTERNAL AIRCRAFT STORES AND EQUIPMENT
M. Steininger and G. Haidl 7 Sep. 1981 17 p refs Presented at 53rd AGARD Struct. and Mater. Panel Meeting, Noordwijkerhout, Netherlands, 27 Sep. - 2 Oct. 1981
(MBB-FE-173/S/PUB/46) Avail: NTIS HC A02/MF A01

Prediction methods for preliminary assessment of aircraft vibration levels and spectra are described. A dynamic environment simulation for external stores configuration tests is discussed. Standard mounting and excitation techniques are reviewed and mounting rig requirements and shaker capabilities are treated. It is shown that trends in aircraft structural design and operational requirements result in increasing vibration problems. Author (ESA)

N82-21219# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.
DYNAMIC RESPONSE OF A HOT GAS, CONTROL-SURFACE ACTUATOR
Erwin Goellner 1981 72 p refs Reprint from J. of Flight Sci. and Space Res. (Cologne), v. 5, no. 4, Jul./Aug. 1981 p 209-218 In GERMAN; ENGLISH summary Presented at 4th Aachener Fluidtech. Kolloq., Aachen, Mar. 1980
(MBB-UA-599/81-OE; ISSN-0342-068X) Avail: NTIS HC A04/MF A01

The operation of a control surface actuator and its steady state valve characteristics are examined. The linearized transfer functions are calculated under simplified assumptions. Suitable parameters are defined and their influence on the stability of the closed loop is discussed. The response of the closed position control loop is demonstrated. Author (ESA)

N82-21220# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge-Entwicklung.
THEORETICAL LINEAR APPROACH TO THE COMBINED MAN-MANIPULATION SYSTEM IN MANUAL CONTROL OF AN AIRCRAFT
Klaus Brauser 2 Jun. 1981 17 p refs Presented at 17th Ann. Conf. on Manual Control, Los Angeles, 16-18 Jun. 1981
(MBB-FE-301/S/PUB/43) Avail: NTIS HC A02/MF A01

The dynamic characteristics of the pilot control system are studied with a model combining the neuromuscular properties of the man with the physical properties of the control system. The man is assumed to be a quasilinear, time invariant control operator adapted to the operating states of the control system. The frequency domain transfer functions of the man control system and the closed loop pilot aircraft control system are posed. The complete precision man control model must be introduced into the closed loop transfer function to understand standard handling criteria and to derive these criteria directly from human operator properties. Author (ESA)

N82-21222# AAI Corp., Cockeysville, Md. Aeronautical Systems Div.
MINUTES OF PHYSICAL CONFIGURATION AUDIT FOR THE F-16 ELECTRONIC WARFARE TRAINING DEVICE
Dec. 1981 54 p
(Contract F33657-79-C-0820)
(AD-A110321; AAI-ER-11613) Avail: NTIS HC A04/MF A01 CSCL 05/9

A physical configuration audit (PCA) of the F-16 electronic warfare training device was conducted. The purpose was to conduct a formal examination of the built version of the simulator against the technical engineering drawings to establish the simulators product baseline. E.A.K.

N82-21223# Air Force Human Resources Lab., Brooks AFB, Tex.
THE 1981 IMAGE 2 CONFERENCE PROCEEDINGS Final Report
Eric G. Monroe, comp. Nov. 1981 508 p refs Proceedings Held at Brooks AFB, Texas, 10-12 Jun. 1981
(AF Proj. 9983)
(AD-A110226; AFHRL-TR-81-48) Avail: NTIS HC A22/MF A01 CSCL 14/2

These proceedings are a collection of papers presented at the 1981 Image Generation/Display Conference 2. The Image Conference is devoted to issues relevant to the development and use of imagery generated and displayed for visual flight simulation. The purpose of the conference is to provide a forum for presenting and discussing topics concerned with the imagery generated for out of the cockpit and sensor visual flight simulation. The 31 papers presented were compatible with the theme of the conference, including both engineering research/development and behavioral research. In the engineering area, papers covered such topics as computer simulated forward looking infrared and low light level television imagery, computer image generation (CIG) texturing of curved surfaces, shuttle mission simulation, nap of the Earth flight simulation, light valve projectors, lasers in simulation, area of interest displays, tactical combat simulation, sensor simulation, and helmet-mounted displays. Topics in behavioral research included such items as effects of visual and motion cues, identification of targets in CIG displays, psychophysical aspects of visual processing, visual illusions, visually induced self motion, determination of visual cue requirements, visual data base development for terrain flight simulation, transformation realism, and strategies to optimize CIG image content. GRA

N82-21224# Mitre Corp., McLean, Va. Metrek Div.
OVERVIEW OF THE O'HARE RUNWAY CONFIGURATION MANAGEMENT SYSTEM
Richard L. Fain Sep. 1981 52 p refs
(Contract DTFA01-81-C-10001)
(AD-A110137; MTR-81W235; FAA-EM-82-5) Avail: NTIS HC A04/MF A01 CSCL 17/7

The O'Hare Runway Configuration Management System (CMS) is an interactive computer algorithm designed to assist the Assistant Chief of the O'Hare facility in selecting runway configurations which minimize delay. The current version of CMS utilizes a full screen input/output structure to enhance near-term implementation within O'Hare's manual ATC environment. This paper presents an overview of the runway selection logic (including the impacts of transitioning between configurations and balancing demand) and describes the system hardware configuration and the functional responsibilities of the participants in the O'Hare application. The historical development of CMS, future potential enhancements in system logic and system implementation, and application of CMS at other airports are also discussed. Author (GRA)

N82-21226# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.
THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF WIND TUNNEL INTERFERENCE DUE TO ANGLE OF ATTACK
Norbert Gruen 29 Aug. 1980 145 p In GERMAN; ENGLISH summary
(MBB-FE-124/S/PUB/34) Avail: NTIS HC A07/MF A01

Using wall pressure measurements, recorded simultaneously with model tests, corrections for model surface pressures are calculated. The difference between experimental wall pressure coefficients and computed free flight pressure coefficient distributions is used as a criterion for the wall interference on the tunnel flow. An evaluation of the wall pressure curves shows that their general shape is predetermined by the empty tunnel and the model support, respectively. Increasing the model angle of attack primarily causes a shift and a change in the gradient of these curves. The calculated free flight pressure coefficients are found to be very small compared to measured values. In order to find the pressure coefficient differences along the tunnel axis, a flow model is established which shows the previously computed differences in pressure coefficients on an imaginary wall at the location of the tunnel wall. The propagation of these disturbances to the tunnel axis is calculated using the finite element method. Results are used to correct measured coefficients for lift, drag and pitching moment. Author (ESA)

N82-21228# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Apparate.
COMPUTER GENERATED IMAGES FOR AIRCRAFT PILOT TRAINING
P. Gueldenpfennig and W. Matze 3 Nov. 1980 19 p refs
(MBB-UA-551/80-OE) Avail: NTIS HC A02/MF A01

The various training tasks envisaged for full mission simulation with a prototype visual system are described and the performance of the system evaluated. The upgrading of the system resulting from this evaluation, and its implementation in the operational simulators, are discussed. Deficiencies were noted in the following areas: scene content due to the limited real time edge processing capability, for the training of ground attack, and takeoff/landing; scene content due to the limited online data base for the training of en route flying; and resolution due to the number of TV lines and raster elements per TV line for the training of ground attack and air-to-air-combat. Author (ESA)

N82-21247# Rolls-Royce Ltd., Derby (England).
TELEMETRY IN AERO ENGINE DEVELOPMENT
A. E. Hubble 1980 19 p
(PNR-90055) Avail: NTIS HC A02/MF A01

The use of an Acurex telemetry system for obtaining in situ strain and temperature measurements of a high pressure compressor rotor disk is described. The transmitter is mounted inside the compressor shaft with an auxiliary supply of cooling air. Calibration techniques of the strain gages, transmitter and receivers are given. Procedures used for selective test bed transmitter frequencies are listed. Laboratory test results for the thermocouple and static strain transmitters show good agreement with manufacturers' data. A comparison with similar battery operated equipment is made. Author (ESA)

N82-21281# Hughes Aircraft Co., Culver City, Calif.
ADVANCED CONCEPTS FOR COMPOSITE STRUCTURE JOINTS AND ATTACHMENT FITTINGS. VOLUME 1: DESIGN AND EVALUATION Final Report, Jul. 1977 - Dec. 1980
J. V. Alexander and R. H. Messinger Nov. 1981 127 p refs 2 Vol.
(Contract DAAJ02-77-C-0076; DA Proj. 1L2-62209-AH-76)
(AD-A110212; HH-80-402-Vol-1; USAAVRADCOM-TR-81-D-21A) Avail: NTIS HC A07/MF A01 CSCL 01/3

The purpose of this program was to develop the technology of applying fiber-reinforced composite materials to helicopter joints and attachment fittings that permit disassembly of major components. A generic design methodology approach was used to make the data developed applicable to ongoing and future helicopter programs. A detail design, analysis, and testing program was carried out on the three joint and fitting concepts selected: wrapped tension fittings, gearbox attachment fittings, and seat attachment fittings. The scope of the study included analytical design tools, including finite element computer analysis; fabrication techniques, with special emphasis on weight and cost effectiveness considerations; structural integrity testing, including static, dynamic, failsafe/safe-life, and ballistic tolerance considerations; and nondestructive inspection (NDI) techniques. Author (GRA)

N82-21404 California State Univ., Sacramento.
ANALYSIS OF VERY LOW FREQUENCY OSCILLATIONS IN A RAMJET COMBUSTOR BY USE OF A SENSITIVE TIME LAG MODEL
In APL The 18th JANNAF Combust. Meeting, Vol. 3 Oct. 1981 p 307-319 refs
(Contract F33615-77-C-2004)
Avail: NTIS HC A20 CSCL 21/9

Pressure oscillations in ramjet combustor were investigated. Coaxial dump combustor configurations and on very low frequency oscillations, oscillations in which the acoustic modes of the combustion chamber are not excited was emphasized. The main features of the analysis are: compressible flow in the air inlet system, bulk oscillations in the combustor, and a combustion response characterized by a time lag sensitive to combustor conditions. Two studies were undertaken by using the analytical model: (1) an empirical correlation for the time lag based on steady state performance data was used; (2) consisted of the calculation of stability limits for the time lag and combustor geometry for various sets of operating conditions. Comparison of the analytical stability limits with the experimental results gave time lag values, which are compared with the empirical correlation used in the first study. E.A.K.

N82-21405 McDonnell-Douglas Research Labs., St. Louis, Mo.
FACTORS INFLUENCING VELOCITY DISTRIBUTIONS AT INLET/COMBUSTOR INTERFACES
M. Sajben, T. J. Bogar, J. C. Kroutil, and J. T. Salmon *In* APL The 18th JANNAF Combust. Meeting, Vol. 3 Oct. 1981 p 321-331 refs
(Contract F49720-77-C-0082)
Avail: NTIS HC A20 CSCL 21/9

Flows in six nominally two dimensional, supercritical diffusers, to highlight the effects of selected parameters and operating conditions on the velocity distributions at the downstream end are reviewed. The state of the flow at this location has a significant influence on the performance and stability of liquid fuel ramjet burners. The investigated parameters include the diffuser exit area/throat area ratio, the terminal shock strength and the boundary layer thickness before the throat. The terminal shock strength was found to be a major factor. Initial boundary layer thickness had only moderate effects on the efflux conditions. It is suggested that methodology developed for assuring inlet engine compatibility in turbojet propulsion systems could be modified to aid ramjet development. E.A.K.

N82-21406 United Technologies Corp., Sunnyvale, Calif. Chemical Systems Div.
REPORT OF THE JANNAF WORKSHOP ON HIGH FREQUENCY INSTRUMENTATION AND DATA ANALYSIS TECHNIQUES
P. A. Chun (Naval Weapons Center, China Lake, Calif.) and R. S. Brown *In* APL The 18th JANNAF Combust. Meeting, Vol. 3 Oct. 1981 p 333-339 refs Conf. held in New Orleans, 28-29 May 1981
Avail: NTIS HC A20 CSCL 21/9

Pressure oscillations in ramjet combustor, instabilities and transients in ramjet engines and facilities were discussed. The development of ramjets and ramrockets and experience with pressure oscillations in other airborne propulsion systems is examined. Current high frequency instrumentation methods and data analysis practices are reviewed. Guidelines for the consistent and proper use of high frequency response instrumentation on ramjet engine and component testing and data acquisition, recording, analysis, and interpretation techniques are considered. Procedures are presented for obtaining consistent, useful, and repeatable pressure oscillation data. E.A.K.

N82-21424# Air Force Engineering and Services Center, Tyndall AFB, Fla. Engineering and Services Lab.
THE EFFECT OF FUEL COMPOSITION ON GROUNDFALL FROM AIRCRAFT FUEL JETTISONING Final Report, Mar. 1980 - Feb. 1981
Harvey J. Clewell, III Mar. 1981 35 p refs
(AF Proj. 1900)
(AD-A110306; AFESC/ESL-TR-81-13) Avail: NTIS HC A03/MF A01 CSCL 01/3

A computer model which simulates the evaporation and free-fall of fuel droplets in the atmosphere was used to determine the effect of fuel composition on the nature and extent of ground contamination by fuel discharged from an aircraft in flight. Three fuel compositions were used: (1) JP-4, the standard Air Force jet fuel; (2) Jet A (JP-8), the standard U.S. commercial jet fuel; and (3) Number 2 Diesel Fuel, representing the upper limit for future, broadened-specification fuels from alternative sources. The results of this study indicate that the amount of liquid fuel reaching the ground from the jettisoning of commercial jet fuels is much greater than for JP-4. Moreover, future broadened specification fuels may produce even greater ground contamination when jettisoned. GRA

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CONFERENCES
Australasian Conference on Hydraulics and Fluid Mechanics, 7th, Brisbane, Australia, August 18-22, 1980, Preprints of Papers A82-26176
Technology transfer; Proceedings of the Thirteenth National Technical Conference, Mount Pocono, PA, October 13-15, 1981 A82-27401
AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings A82-27876
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measurements were made on an Army AH-1S (production) helicopter whose main rotor system was the same as that of the AH-1G helicopter. (Author)

A82-26394 * **Evaluation of the effect of elastomeric damping material on the stability of a bearingless main rotor system.** M. Sheffler, J. Staley (Boeing Vertol Co., Philadelphia, PA), and W. Warmbrodt (NASA, Ames Research Center, Moffett Field, CA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 9 p. 9 refs.

The considered investigation was conducted in connection with a contract to design, fabricate, and test a prototype bearingless main rotor (BMR) system. Part of the design process involved an aeroelastic stability investigation in a wind tunnel. Attention is given to a description of model testing, model test results, the description of the full scale wind tunnel configuration, full scale test results, and aspects of correlation with theory. It was found that the complex geometry of the BMR, with 12.5 degrees of nose-up prepitch at the hub and 2.5 degrees of tip-up predroop at the blade attachment clevis, is required to achieve a stable configuration. Subsequent model testing showed that a constrained layer of elastomer material could increase stability at all rotor speeds and collectives tested for a flat strap configuration. G.R.

A82-26395 **Rotor preliminary design trade-offs for the Advanced Scout Helicopter.** M. P. Scully and R. A. Shinn (U.S. Army, Research and Technology Laboratories, Moffett Field, CA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 21 p.

A description is presented of the Advanced Scout Helicopter (ASH) main rotor design trade-offs required for the selection of rotor diameter, tip speed, blade chord, number of blades, and blade inertia. The rotor design process is a constrained optimization in which both the objective function and the constraints are complicated, nonlinear, and negotiable. The rotor design portion of ASH studies demonstrates the effect of constraints such as autorotation and survivable chord on the design, and shows the importance of developing more realistic versions of these constraints. Attention is given to design objectives, aspects of methodology, design constraints, baseline configurations, and questions of rotor and engine sizing. G.R.

A82-26396 **Performance and aeroelastic tradeoffs on recent rotor blade designs.** D. P. Schrage and J. A. O'Malley (U.S. Army, Development and Qualification Directorate, St. Louis, MO). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 11 p. 15 refs.

A review is conducted of the performance and aeroelastic requirements of a helicopter rotor blade in both hover and forward flight. It is found that aeroelastic simplifications in rotor blade design are no longer practical if optimal performance is to be achieved. It is necessary to consider airfoil geometric variations. The influence of these variations on drag divergence Mach number at lift coefficients from near zero to near maximum lift and on pitching moments must be properly addressed during the design process. Blade torsional frequency, torsional stiffness, and section pitching moment, are exceedingly important parameters in optimizing performance and control loads. These parameters must, therefore, be adequately represented in analytical models. G.R.

A82-26397 **CH-47 fiberglass rotor blade design and fabrication.** R. W. Sandford and R. P. Belko (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 11 p.

A fiberglass rotor blade for the CH-47 Chinook helicopter is now in production. It provides interchangeability, improved performance, failsafe construction, minimum inspection and maintenance requirements, maximum field repairability, and 3600 hours depot level reliability. A composite design optimizes blade geometry and features unidirectional material, titanium nosecap, and a unit-fabricated fairing of fiberglass surrounding a nonmetallic honeycomb core. The stainless-steel lag damper bracket is overwound with prestressed fibers. Bench tests were conducted to ensure against buckling of the spar wall and trailing edge, and to evaluate fatigue of the root ends with results showing that the fatigue life objective would be met. Whirl and flight tests confirmed that the blade fiberglass components, damper bracket and windings have essentially unlimited fatigue life. The titanium nosecap fatigue life substantially exceeded the design objective. C.D.

A82-26398 **Black Hawk rotor de-icing.** J. R. Reilly (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 10 p.

The U.S. Army Black Hawk helicopter is designed to operate in moderate icing conditions. Heating is provided at the engine inlets by engine bleed air and by electrothermal anti-icing elements in the windshield and pitot head. The rotor de-icing system melts the bonding layer of accreted ice, allowing the rest to be shed. A blade heating mat that carries current is integrally built within the leading edge and shielded by dielectric layers. The blades are connected to a distributor which connects to the rotor, which in turn connects to the de-ice controller and detectors. In operation, an off-time heater element responds to a predetermined accumulation of ice by commanding the on-time heater element, which operates until a predetermined ambient temperature is attained. Feedback systems monitor heat distribution and guard against excess current and blade overheating. To conserve power, the two sets of opposing blades are alternately de-iced. In tests, the system consistently produced clean ice shedding over thirty hours of testing. C.D.

A82-26399 **Design optimization of rotor systems for tilt-rotor aircraft that fold for shipboard compatibility.** R. R. Pruyn and R. B. Shannon (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 20 p.

Preliminary design studies have identified the best design concepts for four-bladed prop-rotors that must fold for shipboard compatibility. All practical combinations of folding method and hub configuration were evaluated for operational suitability, maintainability, reliability, cost, and developmental risk. Results show that the scissors-folding hingeless rotor is best if the aircraft configuration can accept a prop-rotor folding length of the prop-rotor diameter. For an aircraft configuration that requires the prop-rotor to fold to a length of approximately the rotor radius, a flexure and elastomeric articulated hub is the best choice. (Author)

A82-26400 **The Circulation Control Rotor /CCR/ control system.** D. R. Barnes (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, National Specialists Meeting on Rotor System Design, Philadelphia, PA, Oct. 22-24, 1980, Paper.* 10 p. 8 refs.

This paper presents an overview of the XH-2/CCR, Circulation Control Rotor Flight Demonstrator, control system design. The circulation control rotor is a major departure from conventional rotor systems and presents the control system designer with both a new set of options and a new set of challenges. The paper emphasizes the CCR unique components and aspects of the control system. Component selection, sizing, integration and operation are addressed. Specific details of the XH-2/CCR control system are presented. Multicyclic control capability is included. (Author)

A82-26401 # **Mach 2.0 rotating arm rain erosion test apparatus.** K. W. Foulke (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings. Atlanta, GA, Georgia Institute of Technology, 1980, p. 61-70.

In studies of radome erosion damage involving aircraft operating in Southeast Asia, it was found that the materials, coatings and designs in use could not withstand such an environment. In connection with a search for improved designs and materials, a survey of possible test methods was conducted. It was concluded that a rotating arm would provide the best laboratory simulation of the environment for investigating rain erosion at subsonic and supersonic speeds. The rotating arm offered the advantages of multiple drop impact, sustained exposure time, test samples of acceptable size, low development cost, and reasonable cost per data point for test velocities to Mach 2.0. The rain erosion test apparatus consists of a four-foot radius arm rotating in a steel chamber 10 feet in diameter. G.R.

A82-26462 # Effects of filler materials upon radome rain erosion performance at subsonic conditions. E. Greene (IBM Corp., Owego, NY). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings.
Atlanta, GA, Georgia Institute of Technology, 1980, p. 71-75.

The considered investigation was initiated after premature blistering of the rain erosion coating and radome soft spots were found to occur on some near sonic speed aircraft after relatively low flight time through rain. A rotating arm rain impact test facility was used as the vehicle simulator in the investigation. Attention is given to the results from three series of rain impact tests. It was found that filler materials used between rain erosion coating and radome substrate may conceal surface blemishes or irregularities and provide an attractive surface appearance. However, the tests show that radome performance can be severely degraded in a rain impact environment. G.R.

A82-26464 # Radome rain damage - An environmental analysis technique. B. J. Crowe (Flight Systems, Inc., Newport Beach, CA). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings.
Atlanta, GA, Georgia Institute of Technology, 1980, p. 86-92. 6 refs. Contracts No. F33615-79-C-5036; No. N60530-79-C-0058; No. N00123-79-C-1042.

An environmental analysis technique has been developed for the rapid evaluation of path-cumulative rainfall statistics. Although the analysis assumes intense rainfall concentrations, the results it produces appear to be similar to those for more uniformly distributed rainfall. The accuracy of the technique is somewhat dependent on the character of the storm distribution models assumed, but parametric analyses have enhanced confidence in the general validity of the results to date. With further refinement, and improvements in the data base, it is believed that the considered approach could provide a much needed means for quantitatively evaluating the rain environment limitations of tactical missile radomes. G.R.

A82-26465 # Radome aerodynamic heating effects on boresight error. L. B. Weckesser (Johns Hopkins University, Laurel, MD). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings. Atlanta, GA, Georgia Institute of Technology, 1980, p. 97-101.

Previous studies have shown that aeroheating of a Pyroceram 9606 radome to temperatures as low as 600 F could cause a large enough change in the RF performance of the radome to affect missile performance. The decision was, therefore, made to carry out an experiment in which direct boresight error (BSE) measurements of a heated radome would be obtained. A description is presented of the special radome/antenna support fixture designed and built specifically for this test program. Attention is also given to aspects of general test arrangement, the radome, the test temperatures, and BSE results. G.R.

A82-26467 # Full scale test facilities for radomes and antenna windows. A. Ossin and H. J. Readey, Jr. (Martin Marietta Aerospace, Orlando, FL). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings.
Atlanta, GA, Georgia Institute of Technology, 1980, p. 107-111.

The CONFLOW and Ramburner test facilities, with newly added capability, will provide a variety of environments and capabilities for the aerothermal and electrical evaluation of full-up radome structures, antenna windows, and material screening. The CONFLOW facility is a computer-controlled, continuous flow, hot air generator. A description is given of an investigation which shows that measurements of radome boresight error can be made at the CONFLOW facility with sufficient accuracy for most known applications of interest, provided the seeker under test can be sufficiently isolated from CONFLOW-induced movement. G.R.

A82-26469 # Duplication of radome aerodynamic heating using the Central Receiver Test Facility solar furnace. R. K. Frazer (Johns Hopkins University, Laurel, MD). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings. Atlanta, GA, Georgia Institute of Technology, 1980, p. 112-116. 5 refs.

An experiment has been conducted that used the solar furnace at the Central Receiver Test Facility (CRTF) in Albuquerque, NM, to create flight-like temperatures in three supersonic missile radomes. The radomes tested have a von Karman profile, are made of Pyroceram 9606 about 0.25 in. thick, and have a fineness ratio of 2.1 with a base diameter of 13.5 in. The purpose of this effort was to measure the changes in radome boresight error (BSE) caused by aerodynamic heating. This paper describes the thermal aspects of the experiment, including the facility selection, heat flux survey measurements, temperature measurements made on a calibration radome, and calibration of optical pyrometers. (Author)

A82-26470 # F-5 Shark Nose Radome - A development overview. G. W. Scott. In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings.
Atlanta, GA, Georgia Institute of Technology, 1980, p. 128-133.

It is pointed out that the Shark Nose Radome, with its pronounced ellipticity and sharp discontinuity edges on the forward region, gave rise to complex interrelationships between materials, structure, mechanical design, manufacturing process, environmental evaluation, and electromagnetic performance. Because of this, the development and test phases required many iterations, trade-offs, and compromises. Extensive ground and flight tests were carried out. The production model was found to satisfy all specifications and is now being installed on production F-5 aircraft. C.R.

A82-26471 # Automated radome performance evaluation in the Radio Frequency Simulation System /RFSS/ facility at MICOM. J. M. Schuchardt, D. J. Kozakoff, D. O. Gallentine, T. N. Long (Georgia Institute of Technology, Atlanta, GA), M. M. Hallum, and B. F. Wilson (U.S. Army, System Simulation and Development Directorate, Redstone Arsenal, AL). In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings.
Atlanta, GA, Georgia Institute of Technology, 1980, p. 134-141. 8 refs.

The need for rapid collection of missile radome/seeker interaction data in the U.S. Army RFSS facility has led to the development of an instrumentation system by the Georgia Institute of Technology. The system consists of a microcomputer-controlled radome positioner and radome measurements receiver. The positioner can handle radomes with diameters up to 18.0 inches and weights up to approximately 50 pounds. The receiver system operates over an RF frequency range of 0.11-18.0 GHz. A microcomputer system featuring dual floppy disk data storage furnishes a method of intermediate test data storage/buffering. Tests carried out with an actual radome/seeker antenna combination demonstrate the signal processing feature of the receiver's microcomputer. C.R.

A82-26479 † The relative motion of a particle in the case of exponential changes of the velocity of the medium (Ob otnositel'nom dvizhenii chastitsy pri eksponentsial'nom izmenenii skorosti sredy). S. V. Ananikov and B. M. Azizov. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 3-6. 13 refs. In Russian.

An analytic solution, expressed by elementary and special functions, is obtained for the relative motion of a particle in a gas flow whose velocity changes exponentially. The case of a single spherical particle in an isothermal gas flow is examined. The analysis is pertinent to the study of combustion processes in jet engines. B.J.

A82-26483 † The effect of the shape of a body on the efficiency of its utilization as a flame stabilizer (Vliianie formy tela na effektivnost' ego ispol'zovaniia v kachestve stabilizatora plameni). V. N. Gruzdev, M. M. Nuriev, and A. V. Talantov. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 43-47. In Russian.

Experimental results are presented on flame stabilizers of various shapes with regard to combustion efficiency, flameout limits, and hydraulic resistance. It is found that the replacement of the

Symposium, Bochum, West Germany, March 20, 21, 1980. Berlin, Springer-Verlag, 1980, p. 161-198. 112 refs.

It is shown through a study of adaptive control applications in the fields of aircraft control systems, industrial process control and electrical drives that, despite the advantages of their sophisticated algorithms, adaptive controls will not be adopted until they are demonstrated to be far superior to classical control techniques. The most successful field of application for adaptive controls has been that of electrical drives, since their system equations and dynamics are well understood and have parasitical vibration modes of high frequency, which can be more easily eliminated in the design process than those encountered in aircraft control. Attention is given to the causes for process industry resistance to adaptive control development, including the complicated dynamic behavior of processes under internal and external disturbances, drifts and parameter changes. O.C.

A82-27876 **AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings.** Conference sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1980. 343 p. Members, $22.50; nonmembers, $30.

Topics considered include TPS management, ATE hardware systems, testing of the next generation commercial airline avionics, testability and built-in test, digital ATG, management information systems for ATE, and propulsion ATE. Attention is also given to system architecture, modular ATE, analog ATE, supporting shipboard electronics, and new and unusual ATE applications. B.J.

A82-27883 **Airline maintenance strategy.** W. Brouwer (KLM Royal Dutch Airlines, Engineering and Maintenance Div., Schiphol Airport, Netherlands). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 38-42.

Problems associated with the maintenance of avionics are discussed, with attention given to the consequences of increases in complexity and reliability, maintenance shop organization, and the role of the technician. The efficiency of LRU removals, the use of automatic test equipment, and the role of software are examined. B.J.

A82-27884 **Airline ATE requirements.** H. E. Harmon (American Airlines, Inc., Dallas, TX). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 43-46.

The general requirements of airline ATE (automatic test equipment) are reviewed, and attention is given to dedicated, modular, general-purpose, and circuit-card ATE. It is noted that maintenance of all-digital avionics will require the full utilization of standardized instrument techniques and the ATLAS test language to accomplish cost effective testing and repair. And it is recommended that airlines effectively communicate these test equipment requirements to the suppliers of future avionics equipment. B.J.

A82-27885 **The role of software in commercial ATE.** G. M. Jenkins (Boeing Computer Services Co., Seattle, WA). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 47-50.

The paper examines the role of software in some specific applications of commercial ATE (automatic test equipment) to the testing of avionics in commercial aircraft. The systems and software used in the Boeing Electronics Test Shop to test units for use in the 707, 727, and 737 aircraft are described. In addition, a new Air Data Computer test station is discussed along with the future use of ATLAS. The role of the software in these systems is considered. B.J.

A82-27886 **The modular ATE.** E. I. Levy (Eastern Air Lines, Inc., Miami, FL). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 51-53.

The Eastern Air Lines concept of modular ATE is presented, with attention given to both hardware and software aspects. Existing maintenance philosophies and the classical ATE are reviewed to show why present concepts are no longer cost effective. Potential problems of the modular ATE concept are examined, and the need for further standardization and close industry cooperation is discussed. B.J.

A82-27887 # **AEWTS - Realistic not futuristic.** D. D. Banks (U.S. Navy, Pacific Missile Test Center, Point Mugu, CA) and D. O. Jacoby (U.S. Naval Air Systems Command, Washington, DC). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 54-59.

The Advanced Electronic Warfare Test Set (AEWTS) program is described, with attention given to AEWTS design considerations, the dual port testing concept, and the operator interface. Phase I studies indicate that AEWTS technical requirements are achievable; in particular it is found that the dual port testing concept is not only realistic and feasible but also cost effective in terms of throughput efficiency. B.J.

A82-27890 # **ATE logistics in the United States Air Force.** R. H. Freeman (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 79-83.

It is noted that the problems and complexities of ATE (automatic test equipment) have a dollar and mission impact that now demands visibility from all levels of USAF management. Several solutions have been proposed to minimize these difficulties. One of the more promising solutions is MATE (Modular Automatic Test Equipment), a cradle-to-grave acquisition methodology approach to ATE. A second solution is to reduce the requirement for ATE by changing USAF maintenance concepts. Both solutions are being actively considered within the USAF for implementation. B.J.

A82-27891 **ATLAS/test data provision for the Tornado ATS - A challenging task.** H. Scheibenzuber (Elektronik-System-Gesellschaft mbH, Munich, West Germany). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 84-89.

The provisions of the ATLAS test specifications/test data for the Line Replaceable Units (LRUs) allocated to the Tornado aircraft Automatic Test System (ATS) are an important part in the development of the maintenance support system of the aircraft. The basic ATLAS/test data requirements include a standard serviceability test and a diagnostic test. LRU test data sheets form the baseline for ATS design and development and consist of four parts: an introduction, LRU test specifications, LRU specific requirements, and LRU interface requirements. The validation of the data is done by checking applicability, structure, syntax and lexicon, compatibility, logic, and diagnostic capability. Engineering support provided includes provision of test sheets, flow charts, and specifications. C.D.

A82-27892 # **Naval Air Systems Command /NAVAIR/ ATE program - Standardized ATE for the carrier environment.** A. W. Rossiter (U.S. Naval Air Systems Command, Washington, DC). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 90-95.

It is pointed out that the principal avionics support equipment goal of the Naval Air Systems Command has been, and remains, to provide timely and effective organic support capability to optimize U.S. aircraft weapon system readiness. A definition is provided of an Automatic Test Equipment (ATE) program that will optimize the avionic repair capability of the shipboard Aircraft Intermediate Maintenance Department. Attention is given to four factors which illustrate the unique nature of carrier support, and the ATE program plan is discussed. The Family of Common ATE is considered, taking into account aspects of general avionics support, inertial navigation system support, electro-optical support, and electronic warfare system support. A Consolidated Support System to meet the advanced support needs of the 1990's is also examined. G.R.

A82-27893 **Configuration management techniques for automatic testing.** R. W. Tobias, G. D. Scherer, and W. H. Kraper (AAI Corp., Baltimore, MD). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 99-104.

The configuration management process as it relates to automatic testing is discussed with reference to a process developed for an automatic test system supporting the P3 ORION long-range patrol aircraft. Attention is given to problems involved in the control of the hardware and software of the three key items: the automatic test system, the unit under test, and the test program test. It is emphasized that the configuration management process relating to each of these three items is critical to the overall success of the maintenance and support process. V.L.

A82-27903 **Pacer Comet II jet engine test system.** A. M. Bishop (Control Data Corp., Professional Services Div., San Antonio, TX). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 199-202.

The ten year evolution of the Pacer Comet system has produced a versatile, 'full-authority', minicomputer based test system which simultaneously controls engine testing in four test cells. This fully automated test system is operational at Kelly, Tinker and Edwards Air Force Bases. The hardware and software evolution are described with particular emphasis on the lessons learned. It will also describe the present software structure, engine test supervisor, interface between executive and UUT software, and the operator interface. Concluding remarks address the human engineering aspect of automation. (Author)

A82-27904 **The United States Air Force Automated Vibration Diagnostics System /AVID/ for improved jet engine maintenance.** R. A. Rio (Mechanical Technology, Inc., Latham, NY). In: AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 203-208.

This paper describes the successful application of an Automated Vibration Diagnostic System (AVID) in the U.S. Air Force's high-volume engine overhaul center at Tinker Air Force Base, OK. The AVID concept to automate troubleshooting procedures for fully-assembled rebuilt engines is addressed. This system extracts high-frequency vibration data from existing standard instrumentation, thereby providing meaningful mechanical information. A growing appreciation on the part of engine overhaul personnel of the power of automated test equipment has enabled these key features to be combined to reduce operating expenses at engine rebuild facilities. (Author)

A82-27920 # **Aerial combat simulation in the U.S. Air Force.** P. A. Cook (USAF, Human Resources Laboratory, Williams AFB, AZ). In: Computer Graphics Symposium, Phoenix, AZ, April 24, 1982, Proceedings. New York, American Institute of Aeronautics and Astronautics, 1982, p. 16-19.

The history, current applications, research programs, and features of future air combat simulators for pilot training are reviewed. The Link system, invented in 1929, provided good cockpit orientation and instrumentation instruction. Current Air Force simulators, specifically those located in Phoenix, AZ, are mounted on six-degrees-of-freedom motion simulators. Seven visual display screens provide a 300 x 140 deg horizontal by vertical field of view, and are configured for A-10 and F-16 fighters. Experiments with pilots trained in simulators and in classrooms for strafing and air-to-ground bombing missions have demonstrated that simulator trained pilots are more proficient in real flights past the seventh mission. Improvements in full combat simulation are reviewed, noting that human eyes are still keener than raster scans, and techniques for improving resolution and developing multiple interactive cockpits are outlined. M.S.K.

A82-27946 **Corona and antenna effects on the RH-53D minesweeping helicopter and Raydist navigation set.** J. F. Shaeffer, L. N. Medgyesi-Mitschang (McDonnell Douglas Research Laboratories, St. Louis, MO), J. W. Weber, S. R. Jacobs (McDonnell Aircraft Co., St. Louis, MO), and P. Eisenhauer (U.S. Navy, Naval Coastal Systems Center, Panama City, FL). In: International Symposium on Electromagnetic Compatibility, Baltimore, MD, October 7-9, 1980, Symposium Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 254-264. 11 refs. Contract No. N61339-77-C-0094.

A series of flight and bench tests have been carried out in order to determine the origin of interference effects on the Raydist navigation system of the Navy RH-53D minesweeping helicopter during the streaming, towing, and recovery of the minesweeping gear. Two distinct mechanisms have been identified by which the tow cable can cause unwanted effects on the navigation system: (1) a negative corona discharge (Trichel pulses) from the tow cable caused by electrification of the helicopter in the streaming and recovery modes; and (2) interaction of the monopole antenna with the tow cable in the towing mode. V.L.

A82-28016 † **Analysis of the temperature field of a baffle-cooled gas-turbine-engine blade under conjugated boundary conditions (Raschet temperaturnogo polia okhlazhdaemoi deflektornoi lopatki GTU pri sopriazhennykh granichnykh usloviiakh).** Iu. I. Shvets, A. Sh. Dorfman, O. I. Didenko, and O. D. Lipovetskaia (Akademiia Nauk Ukrainskoi SSR, Institut Tekhnicheskoi Teplofiziki, Kiev, Ukrainian SSR). *Promyshlennaia Teplotekhnika*, vol. 4, Mar.-Apr. 1982, p. 9-14. In Russian.

A high-accuracy method is developed for calculating gas-blade heat transfer coefficients and temperature fields of baffle-cooled gas-turbine-engine blades under conjugated boundary conditions. An example of such calculation is discussed, and it is shown that at some points of the blade the heat transfer coefficients obtained with this method can differ by 40% from coefficients obtained by conventional calculation methods. B.J.

A82-28018 † **Investigation of heat transfer in the vicinity of the leading and trailing edges of a cooled nozzle blade of a low-consuming gas turbine (Issledovanie teploobmena v zone vkhodnoi i vykhodnoi kromok okhlazhdaemoi soplovoi lopatki maloraskhodnoi gazovoi turbiny).** Iu. S. Osherov (Nauchno-Proizvodstvennoe Ob'edinenie, Proletarskii Zavod, Leningrad, USSR). *Promyshlennaia Teplotekhnika*, vol. 4, Mar.-Apr. 1982, p. 34-37. 5 refs. In Russian.

Electrocalorimetry was used to study heat transfer near the leading and trailing edges of a cooled nozzle blade of a low-consuming gas turbine. Relationships are obtained for determining the mean and local values of heat transfer coefficients. The results are pertinent to the development of a cooling method for regions near the leading and trailing edges of nozzle blades. B.J.

A82-28019 † **The effect of temperature-time factors on the metal damage and endurance characteristics of gas-turbine-engine rotor blades (Vliianie temperaturno-vremennykh faktorov na povrezhdenie metalla i kharakteristiki vynoslivosti rabochikh lopatok GTD).** V. T. Troshchenko, B. A. Griaznov, I. A. Makovetskaia, O. I. Marusii, and Iu. S. Nalimov (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR). *Promyshlennaia Teplotekhnika*, vol. 4, Mar.-Apr. 1982, p. 65-69. In Russian.

The endurance of turbine rotor blades was tested after prolonged operation. A significant reduction in blade endurance is revealed after 20,000 hours of operation. The main cause of observed defects was found to be the formation of a sulfur-saturated surface layer. In addition, some of the blades exhibited a reduction in cyclic strength and a displacement of the fatigue-crack-initiation zone from the base of the blade to its center. B.J.

high-quality flow visualization of complex fluid flows and insight into the phenomenological aspects of vortex generation, interactions between multiple vortices and aerodynamic surfaces and vortex burst. GRA

N82-20472# Massachusetts Inst. of Tech., Cambridge. Dept. of Ocean Engineering.
EXPERIMENTAL METHODS FOR THE PREDICTION OF THE EFFECT OF VISCOSITY ON PROPELLER PERFORMANCE Ph.D. Thesis
Sukeyuki Kobayashi Jun. 1981 155 p refs
(Contract N00014-76-C-0357; SR0090101)
(AD-A109846; OE-81-7) Avail: NTIS HC A08/MF A01 CSCL 13/10

A Laser Doppler Velocimeter (LDV) was used to perform a propeller wake survey for DTNSRDC propellers 4381 and 4383. Three components of the velocity were measured and from this, the velocity field and the vorticity field were constructed. Through a coordinate transformation, the vorticity field was separated into two parts i.e., trailing vorticity and boundary layer type vorticity in the viscous wake. The data was used for the prediction of propeller blade profile drag (viscous sectional drag). The idea of hypothetical flow by Betz was extended to propeller flow and a formula for the profile drag was derived in terms of velocities, which is suitable for LDV application. The radial distribution of profile drag was computed using the velocity data. It was shown that the value of Cd is close to that of 2-dimensional section at mid-radius range, but becomes substantially lower at inner and outer radii and that it goes up again near the tip and the hub. This trend is consistent with the behavior of profile drag of a finite span wing. Author (GRA)

N82-20544*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
VARIABLE RESPONSE LOAD LIMITING DEVICE Patent Application
Dwight D. McSmith, inventor (to NASA) Filed 6 Oct. 1981 18 p
(NASA-Case-LAR-12801-1; US-Patent-Appl-SN-309291) Avail: NTIS HC A02/MF A01 CSCL 13I

An energy absorbing device used as a load limiting member in a structure to control its response to applied loads is described. It functions by utilizing a spool assembly having flanged ends and an interior cavity of sufficiently large diameter to cause it to deform plastically at a prescribed load. In application, the spool is utilized as a pivot point for the legs of an aircraft seat. When properly designed and integrated into the seat arrangement the spool will twist about its axis, deforming plastically when the impact load exceeds the spool yield value. Through this deformation, the spool absorbs the kinetic energy of the movement of the seat at a substantially constant rate, thereby controlling the level of loads transmitted to the seat occupant. By proper sizing and selection of materials, it is possible to control load response in a predictable manner. NASA

N82-20545*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TUBING AND CABLE CUTTING TOOL Patent Application
Dwight D. McSmith and James I. Richardson, inventors (to NASA) Filed 6 Oct. 1981 10 p
(NASA-Case-LAR-12786-1; US-Patent-Appl-SN-309292) Avail: NTIS HC A02/MF A01 CSCL 13I

A hand held hydraulic cutting tool was developed which is particularly useful in deactivating ejection seats in military aircraft rescue operations. The tool consists primarily of a hydraulic system composed of a fluid reservoir, a pumping piston, and an actuator piston. Mechanical cutting jaws are attached to the actuator piston rod. The hydraulic system is controlled by a pump handle. As the pump handle is operated the actuator piston rod is forced outward and thus the cutting jaws are forced together. The frame of the device is a flexible metal tubing which permits easy positioning of the tool cutting jaws in remote and normally inaccessible locations. Bifurcated cutting edges ensure removal of a section of the tubing or cable to thereby reduce the possibility of accidental reactivation of the tubing or cable being severed. NASA

N82-20549# Pace Associates, Inc., Milwaukee, Wis.
HEAVY-DUTY ENGINES ANALYSIS, STUDY 4: A PRELIMINARY MARKET ANALYSIS FOR GAS-TURBINE APPLICATIONS IN THE FARM MARKET
Jul. 1981 18 p refs Prepared for Argonne National Lab.
(Contract W-31-109-eng-38)
(DE82-001756; ANL/CNSV-TM-81) Avail: NTIS HC A02/MF A01

The opportunity for the gas turbine in the farm market and if the market's requirements complement the development of the engine for other markets was analyzed. It was determined that the major applications of gas turbines in the farm equipment market are in two wheel drive and four wheel drive diesel powered tractors. However, the market for gas turbines lies at the heavier end of the spectrum. There is an opportunity for larger quantities of lower horsepower engines because turbine engines for automobiles would be in the same size range. It is suggested that the development of a reliable multifuel turbine combined with a reliable power train capable of meeting the load requirements of the farm tractor is a timely undertaking. Fuel efficiency requirements are balanced by the need for multifuel capability and imposed environmental requirements. DOE

N82-20561*# California Univ., Los Angeles.
APPLICATION OF THE FINITE ELEMENT METHOD TO ROTARY WING AEROELASTICITY Final Report
F. K. Straub and P. P. Friedmann Feb. 1982 232 p refs
(Grant NsG-1578)
(NASA-CR-165854; NAS 1.26:165854; UCLA-ENG-80-81) Avail: NTIS HC A11/MF A01 CSCL 20K

A finite element method for the spatial discretization of the dynamic equations of equilibrium governing rotary-wing aeroelastic problems is presented. Formulation of the finite element equations is based on weighted Galerkin residuals. This Galerkin finite element method reduces algebraic manipulative labor significantly, when compared to the application of the global Galerkin method in similar problems. The coupled flap-lag aeroelastic stability boundaries of hingeless helicopter rotor blades in hover are calculated. The linearized dynamic equations are reduced to the standard eigenvalue problem from which the aeroelastic stability boundaries are obtained. The convergence properties of the Galerkin finite element method are studied numerically by refining the discretization process. Results indicate that four or five elements suffice to capture the dynamics of the blade with the same accuracy as the global Galerkin method. A.R.H.

N82-20566*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ELASTIC-PLASTIC FINITE-ELEMENT ANALYSES OF THERMALLY CYCLED DOUBLE-EDGE WEDGE SPECIMENS
Albert Kaufman and Larry E. Hunt Mar. 1982 31 p refs
(NASA-TP-1973; E-626; NAS 1.60:1973) Avail: NTIS HC A03/MF A01 CSCL 20K

Elastic-plastic stress-strain analyses were performed for double-edge wedge specimens subjected to thermal cycling in fluidized beds at 316 and 1088 C. Four cases involving different nickel-base alloys (IN 100, Mar M-200, NASA TAZ-8A, and Rene 80) were analyzed by using the MARC nonlinear, finite element computer program. Elastic solutions from MARC showed good agreement with previously reported solutions obtained by using the NASTRAN and ISO3DQ computer programs. Equivalent total strain ranges at the critical locations calculated by elastic analyses agreed within 3 percent with those calculated from elastic-plastic analyses. The elastic analyses always resulted in compressive mean stresses at the critical locations. However, elastic-plastic analyses showed tensile mean stresses for two of the four alloys and an increase in the compressive mean stress for the highest plastic strain case. M.G.

N82-20573# Sandia Labs., Albuquerque, N. Mex.
APPROACH TO THE FATIGUE ANALYSIS OF VERTICAL-AXIS WIND-TURBINE BLADES
P. S. Veers Sep. 1981 35 p refs
(Contract DE-AC04-76DP-00789)
(DE82-003193; SAND-81-2130) Avail: NTIS HC A03/MF A01

The stress history of wind turbine blades indicates that a single stress level at each wind speed does not adequately describe the blade stress history and a statistical description is required. Blade stress data from experimental turbines indicate that the Rayleigh probability density function describes the distribution of vibratory stresses at each wind speed. The Rayleigh probability density function allows the distribution of vibratory stresses to be described by the RMS of the stress vs. time signal. With the RMS stress level described for all wind speeds, the complete stress history of the turbine blades is known. Miner's linear cumulative damage rule is used as a basis for summing the fatigue damage over all operating conditions. An analytical expression is derived to predict blade fatigue life. DOE

N82-20748 Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Optoelektronik.

RANGEFINDER SYSTEM FOR SLANT RANGE VISIBILITY [WEGE ZUR NETZMAESSIGEN ERFASSUNG DER SCHRAEGSICHT]

Christian Werner *In* Deutscher Wetterdienst Soc. Meteorol. Palatine, 1780-1795 1980 p 60-65 refs In GERMAN; ENGLISH summary

Avail: Issuing Activity

Careful measurement of the slant range visibility is important for safe and regular aircraft landing operations. Measurements are necessary under visibility conditions lower than 1500 m up to an altitude of about 100 m. Many remote sensing methods are known to determine the slant range visibility. A modified laser rangefinder system which uses a simplified slope method is described. The accuracy of this 'Two-Point-Method' is analyzed for several atmospheric conditions. Measurements with a described prototype system are presented. J.M.S.

N82-20811# Systems Control, Inc., West Palm Beach, Fla.

WEATHER DETERIORATION MODELS APPLIED TO ALTERNATE AIRPORT CRITERIA Final Report

Edwin D. McConkey Sep. 1981 103 p
(Contract DOT-FA79NA-6029)
(AD-A108877; FAA-RD-81-92) Avail: NTIS HC A06/MF A01 CSCL 04/2

Flights under Instrument Flight Rules (IFR) require the filing of a flight plan. The flight plan must contain an alternate airport unless certain conditions at the destination are met. These conditions concern the availability of an instrument approach procedure and anticipated meteorological conditions within one hour of the estimated arrival time. Certain other conditions must be met for an airport to qualify as an alternate airport. These conditions also are based on instrument approach procedure availability and forecast meteorological conditions. Relaxation of the current requirements regarding alternate airports could benefit some aircraft operators by improving schedule reliability and reducing the number of weather related departure delays. The investigation quantified the increased risk of ceilings and visibilities being below landing minimums at several cities in the conterminous U.S. if requirements are relaxed. The study methods utilized climatology data and weather deterioration models to calculate the probability of an airport being below precision and non-precision approach minimums. Author (GRA)

N82-20897# Hampton Inst., Va. Dept. of Mathematics and Computer Science.

A DESCRIPTIVE STUDY OF THE APPLICATION OF ANALYSIS OF VARIANCE AND REGRESSION TECHNIQUES IN AN ERROR ANALYSIS PROGRAM FOR TEST DATA OBTAINED IN A 16 FOOT TRANSONIC TUNNEL M.S. Thesis

Daisy Williams Alston Apr. 1981 216 p refs
Avail: NTIS HC A10/MF A01

A mathematical model has been designed that used standard statistical techniques to perform an error analysis of wind tunnel test data. Three separate but dependent computer programs define the procedure necessary for the generation and manipulation of the required data. By applying the methods of least squares, cubic splines, analysis of variance, and regression analysis, the programs calculate and compare experimental data with test control data. The solution of the problem reveals that the nature of the lift and drag coefficient data versus angle of attack vary linearly, therefore the equation of a straight line is sufficient to represent the data. To minimize the residual differences, a third order curve fit, which defines an equation that represents the experimental pressure coefficient data, is used. Calculation of the F-ratios determines the significant components of the 2 x 7 x 6 factorial design and indicates the independent variables that significantly reduce the error factor. M.G.

N82-21031*# Avco Lycoming Div., Stratford, Conn.

YF 102 IN-DUCT COMBUSTOR NOISE MEASUREMENTS WITH A TURBINE NOZZLE, VOLUME 1 Final Report, Sep. 1979 - Mar. 1981

Craig A. Wilson and James M. OConnell Sep. 1981 83 p refs
(Contract NAS3-21974)
(NASA-CR-165562-Vol-1; NAS 1.26:165562-Vol-1;
LYC-81-32-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 20A

The internal noise generated by an Avco Lycoming YF-102 engine combustor installed in a test rig was recorded. Two configurations were tested one with and one without the first stage turbine nozzle installed. Acoustic probes and accessories were used. Internal dynamic pressure level measurements were made at ten locations within the combustor. The combustor rig, the test procedures, and data acquisition and reduction systems are described. Tables and plots of narrow band and one third octave band pressure level spectra are included. S.L.

N82-21032*# Avco Lycoming Div., Stratford, Conn.

YF 102 IN-DUCT COMBUSTOR NOISE MEASUREMENTS WITH A TURBINE NOZZLE, VOLUME 2 Final Report

Craig A. Wilson and James M. OConnell Sep. 1981 232 p refs
(Contract NAS3-21974)
(NASA-CR-165562-Vol-2; NAS 1.26:165562-Vol-2;
LYC-81-32-Vol-2) Avail: NTIS HC A11/MF A01 CSCL 20A

The internal noise generated by an Avco Lycoming YF-102 engine combustor installed in a test rig was recorded. The one third octave band pressure level spectra is presented. S.L.

N82-21033*# Avco Lycoming Div., Stratford, Conn.

YF 102 IN-DUCT COMBUSTOR NOISE MEASUREMENTS WITH A TURBINE NOZZLE, VOLUME 3 Final Report

Craig A. Wilson and James M. OConnell Sep. 1981 244 p refs
(Contract NAS3-21974)
(NASA-CR-165562-Vol-3; NAS 1.26:165562-Vol-3;
LYC-81-32-Vol-3) Avail: NTIS HC A11/MF A01 CSCL 20A

The internal noise generated by an Avco Lycoming YF-102 engine combustor installed in a test rig was recorded. The narrow band pressure level spectra is presented. S.L.

N82-21037*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FLUCTUATING PRESSURES ON FAN BLADES OF A TURBOFAN ENGINE: STATIC AND WIND-TUNNEL INVESTIGATIONS

James A. Schoenster Mar. 1982 48 p refs
(NASA-TP-1976; L-14913; NAS 1.60:1976) Avail: NTIS HC A03/MF A01 CSCL 21E

To investigate the fan noise generated from turbofan engines, miniature pressure transducers were used to measure the fluctuating pressure on the fan blades of a JT15D engine. Tests were conducted with the engine operating on an outdoor test stand and in a wind tunnel. It was found that a potential flow interaction between the fan blades and six, large support struts in the bypass duct is a dominant noise source in the JT15D engine. Effects of varying fan speed and the forward speed on the blade pressure are also presented. Author

N82-21041# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

ACOUSTIC MEASUREMENTS OF F-4E AIRCRAFT OPERATING IN HUSH HOUSE, NSN 4920-02-070-2721 Final Report, May - Sep. 1981

Vincent R. Miller, G. A. Fisk, and J. M. Chinn Sep. 1981 105 p refs
(AD-A108827; AFWAL-TM-81-84-FIBE/FIBG) Avail: NTIS HC A06/MF A01 CSCL 20/1

The primary purpose of this test program was to measure the acoustic environment in the hush house facility located at Kelly Air Force Base, Texas, during operation of the F-4E aircraft to ensure that aircraft structural acoustic design limits were not exceeded. The acoustic measurements showed that sonic fatigue problems are anticipated with the F-4E aircraft aft fuselage structure during operation in the hush house. The measured acoustic levels were less than those measured in an F-4E aircraft water cooled hush house at Hill AFB in the lower frequencies, but were increased over that measured during ground run up on some areas of the aircraft. It was recommended that the acoustic loads measured in this program should be specified in

N82-21483# Naval Air Systems Command, Washington, D. C.
CONFORMAL ANTENNA ARRAY DESIGN HANDBOOK
R. C. Hansen, ed., P. T. Bargeliotes, J. Boersma, Z. W. Cheng, K. E. Golden, A. Hessel, W. H. Kummer, R. Mather, H. E. Mueller, and D. C. Pridmore-Brown Sep. 1981 440 p refs
(AD-A110091) Avail: NTIS HC A19/MF A01 CSCL 09/5

A discussion of conformal antenna arrays is divided in the following three categories: low gain antennas for small missiles and artillery rounds; fuselage mounted ECM arrays for aircraft; and electronically scanned arrays covering wide angles. Conforming the array to the surface not only saves space and allows rapid inertialess scan but often is essential for structural reasons. L.F.M.

N82-21532*# Douglas Aircraft Co., Inc., Long Beach, Calif.
LAMINAR FLOW CONTROL SPF/DB FEASIBILITY DEMONSTRATION Final Report
R. C. Ecklund and N. R. Williams Oct. 1981 50 p
(Contract NAS1-16425)
(NASA-CR-165818; NAS 1.26:165818) Avail: NTIS HC A03/MF A01 CSCL 20D

The feasibility of applying superplastic forming/diffusion bonding (SPF/DB) technology to laminar flow control (LFC) system concepts was demonstrated. Procedures were developed to produce smooth, flat titanium panels, using thin -0.016 inch sheets, meeting LFC surface smoothness requirements. Two large panels 28 x 28 inches were fabricated as final demonstration articles. The first was flat on the top and bottom sides demonstrating the capability of the tooling and the forming and diffusion bonding procedures to produce flat, defect free surfaces. The second panel was configurated for LFC porous panel treatment by forming channels with dimpled projections on the top side. The projections were machined away leaving holes extending into the panel. A perforated titanium sheet was adhesively bonded over this surface to complete the LFC demonstration panel. The final surface was considered flat enough to meet LFC requirements for a jet transport aircraft in cruising flight. Author

N82-21600# British Aerospace Aircraft Group, Kingston-upon-Thames (England). Ground Test Services Dept.
POSITRON ANNIHILATION
A. Turner Sep. 1980 8 p refs
(BAE-KGT-N-GEN-00996) Avail: NTIS HC A02/MF A01

A nondestructive investigative technique, using positron annihilation, is introduced, and the physics of it are explained. The collision of a positron and an electron under thermal conditions causes the emission of annihilation radiation in the form of two gamma rays. This radiation is detected using lithium drifted germanium or intrinsic germanium detectors. Applications are limited to quality control, where the very small detection area, (0.55 sq mm to a few sq cm) is not impractical, and to monitor areas with a known defect and following the progress of cracks. Whole aircraft or large component, scanning is not possible because of the enormous number of probes required. Author (ESA)

N82-21601# Royal Aircraft Establishment, Farnborough (England).
NON-DESTRUCTIVE INSPECTION AND THE IMPLEMENTATION OF A DAMAGE TOLERANT DESIGN PHILOSOPHY
D. E. W. Stone Feb. 1981 15 p refs
(RAE-TM-Struct-982; BR78531) Avail: NTIS HC A02/MF A01

Increasing demands are being made for more quantitative NDI, but current inspection capabilities are inadequate. It is difficult to compare destructive and NDI data. Corrosion degrades inspection capability; 90% probability of detection of flaws with a 95% confidence bound is necessary, but only a 50% detection probability is attainable, for a 1/2 inch crack size, with a 95% confidence level. The implementation of a damage tolerant design philosophy requires a less subjective judgement to be made than is the case at present. Author (ESA)

N82-21777# National Academy of Sciences - National Research Council, Washington, D. C. Committee on Hearing Bioacoustics and Biomechanics.
ASSESSMENT OF COMMUNITY RESPONSE TO HIGH-ENERGY IMPULSIVE SOUNDS
William J. Galloway Jul. 1981 32 p refs
(AD-A110110) Avail: NTIS HC A03/MF A01 CSCL 20/1

A dose-response relationship between day-night average C-weighted sound level and average degree of community annoyance is proposed for high-energy impulsive sounds. This proposal revises the relationship originally recommended in a NRC-CHABA report (1977) to reflect more recent community response data and additional analyses of previous data. The use of sound level-weighted population as a means for assessing noise impact, as originally proposed by CHABA, is retained in this proposal. Author (GRA)

N82-21788# Rolls-Royce Ltd., Derby (England).
THE IMPACT AND FUTURE DIRECTION OF AIRCRAFT NOISE CERTIFICATION
M. J. T. Smith 1980 29 p refs Presented at 1980 Intern. Conf. on Noise Control Eng., Miami, Dec. 1980
(PNR-90053) Avail: NTIS HC A03/MF A01

The impact of soaring fuel costs and environmental quality pressures is discussed. After a decade of noise legislation, little real improvement has been made. The current growing emphasis on noise footprints has scared manufacturers and operators into believing that a second more powerful certification process at the airport could soon be brought into force. Existing legislation will either be replaced by newer legislation in the nineteen eighties or will become more effective. A better adaptation of existing procedures is suggested which would eliminate the need for secondary controls around airports, the operator and the airport managers judging for themselves the real impact of a new aircraft within the designated route structure. Author (ESA)

N82-21796# Helsinki Univ. of Technology, Espoo (Finland). Inst. of Physics.
ON THE GRAVIMETRIC INVERSION PROBLEM
D. O. Riska 1981 30 p refs
(Rept-129) Avail: NTIS HC A03/MF A01

The multipole expansion series for the gravitational potential and acceleration anomalies on the flat surface of the Earth due to a subterranean body of finite extent are inverted. Explicit formulae for the multipole moments are given in terms of the potential and acceleration components on the surface. Finally a model independent method for the determination of the shape of a starlike body of fixed density from the multipole moments is presented. The results lead to a constructive approach to the inversion problem of gravimetry and also indicate an optimal set of measurement points. Author

N82-21799# Council for Scientific and Industrial Research, Pretoria (South Africa).
ON GEOMORPHOLOGICAL CONVERGENCES. THE CASE OF THE NAMIB DESERT RELIEF (SKELETON COAST AND CENTRAL NAMIB DESERT - SOUTH WEST AFRICA/NAMIBIA)
Uwe Rust 1981 21 p Transl. into ENGLISH from Mitt. der Geograph. Ges. (Munich), v. 64, 1979 p 201-216 Presented at the 42nd German Geographic Meeting, Goettingen, West Germany, 5 Jun. 1979
(CSIR-Trans-1583) Avail: NTIS HC A02/MF A01

Convergence of forms and processes are studied in relation to geomorphological evidence found in the Namib desert. The concept of 'convergence' as a current principle is emphasized. The formation of sharp edged debris by gypsum wedging is compared with the formation of debris by frost wedging in a periglacial environment. In the Namib desert the gypsum wedging which results in material disintegration is linked to gypseous crust formation, and therefore rocks with different genetics can be solidly united by this crust. Important differences between the formative requirements in the Namib desert and in the periglacial environment are mentioned. Time as a factor is very important when it comes to obtaining an understanding of geomorphological convergences. S.L.

N82-22006# Rolls-Royce Ltd., Derby (England). Dept. of Noise Systems.
STANDARDS IN AIRCRAFT NOISE CERTIFICATION
L. R. Bentley 1980 7 p Presented at NPL Conf. on Std. in Acoustics, Teddington, Engl., 8 Oct. 1980
(PNR-90052) Avail: NTIS HC A02/MF A01

The development of the International Civil Aviation Organization and Federal Aviation Agency noise standards is reviewed and compared. The assessment of the effectiveness of standards by on-site measurements by different organizations, and by distribution of magnetic tapes of measurements is mentioned.

The development of root mean square detectors employing digital techniques has simplified the standardization of detector performance. Atmospheric attenuation effects on certification measurements are outlined and problems caused by reflected sound waves received by the microphone located at the mandatory 1.2 m height are cited. Author (ESA)

N82-22007# Royal Aircraft Establishment, Farnborough (England).
SOME APPLICATIONS OF HARTMANN-TYPE SOURCES IN AIRCRAFT NOISE RESEARCH
T. A. Holbeche and R. W. Jeffrey Nov. 1980 18 p refs
Presented at Spring Meeting of the Inst. of Acoustics, Nottingham, England, Mar. 1975
(RAE-TM-AERO-1877; BR77146) Avail: NTIS HC A02/MF A01

Inflight shielding experiments were performed with a slender delta research aircraft fitted with needle stabilized generators having 19mm diameter driving jets operated from the high pressure turbine of the aircraft engine. Acoustic power output is 1 kW and consists of a strong fundamental 2.8 kHz tone and higher harmonics, discernible above engine noise. Comparative wind tunnel experiments employed quarter-scale versions built to match the tunnel model and these operated at 11 kHz, the output level being well above tunnel backgroung noise. Calibration in an anechoic room shows output to be steady and nearly omnidirectional. Author (ESA)

N82-22008# Rolls-Royce Ltd., Derby (England).
THE BENEFITS OF DATA EXCHANGE
J. R. Fawn 1980 14 p
(PNR-90048) Avail: NTIS HC A02/MF A01

The analysis of operational data and its use in forecasting engine performance is promoted as a cost effective way to identify needed manufacturer engineering action, shop repair policy, and line maintenance policy. Emphasis is placed on the modular large fan engine. The engine manufacturer needs data concerning aircraft utilization, reliability of aircraft, engines, components and systems, as well as safety, engineering and shop data. The need for a standard format is mentioned. A forecasting model for component failure is briefly described for the RB211 engine. Author (ESA)

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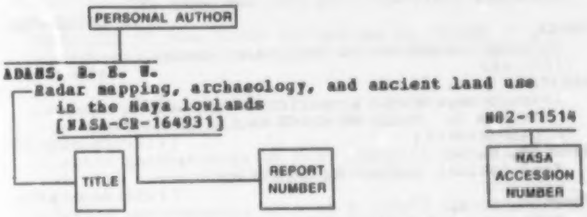

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conventional V-shaped stabilizer by a hydraulically equivalent flat-plate stabilizer makes it possible to reduce the mass of the stabilizer array without reducing the combustion efficiency. B.J.

A82-26486 † Requirements on modern mathematical models of gas turbine engines. I (Trebovaniia k sovremennym matematicheskim modeliam gazoturbinnykh dvigatelei. I). E. B. Mats and A. P. Tunakov. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 63-65. 6 refs. In Russian.

Requirements assuring the sufficient accuracy of mathematical models of gas turbine engines are discussed. Consideration is given to the possibility of taking into account the following characteristics: moisture, gas dissociation, changes in the composition and properties of the working fluid, the turbine characteristics, the Reynolds number, changes in the loss coefficient and the combustion efficiency, radial flow nonuniformity, and static-pressure difference. B.J.

A82-26487 † Method for engine-airframe integration using a high-level computer-assisted engine design system of the Apparat series (Metodika soglasovaniia dvigatelia i samoleta v SAPR-D verkhnego urovnia tsikla 'Apparat'). S. V. Rumiantsev and V. A. Sgilevskii. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 66-70. In Russian.

The theoretical principles underlying engine-airframe integration using a high-level computer-assisted engine design system are presented. The integration approach is described in detail, and a block diagram of the integration system is presented. B.J.

A82-26491 † Application of combined balancing methods to flexible rotors of aviation gas-turbine engines (Primenenie kombinirovannykh metodov uravnoveshivaniia gibkikh rotorov aviatsionnykh gazoturbinnykh dvigatelei). A. I. Gleizer. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 81-85. 5 refs. In Russian.

A82-26492 † Determination of losses in a channel with a sudden expansion behind a diffusor (K voprosu opredeleniia poter' v kanale s vnezapnym rasshireniem, raspolozhennym za diffuzorom). A. Ia. Dantsyg, N. M. Petrov, and N. N. Ponomarev. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 86-89. In Russian.

An exact and relatively simple method is proposed for determining total-pressure losses in a step diffusor, i.e., a system consisting of a diffusor and a channel with a sudden expansion. This method makes it possible to develop a procedure for analyzing losses in a step diffuser with allowance for gas compressibility in the case of variations of the degree of sudden expansion. B.J.

A82-26494 † The formation of benzpyrene during the combustion of aviation fuels (K voprosu ob obrazovanii benz/a/pirena pri gorenii aviatsionnykh topliv). V. P. Lukachev, Iu. A. Knysh, A. A. Gorbatko, and A. V. Ivliev. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 94-96. 5 refs. In Russian.

It has been suggested that the emission of benzpyrene during the combustion of jet-engine fuels should be accompanied by the emission of smoke and carbon monoxide. Experimental results are presented on the emission of benzpyrene during the combustion of kerosene in two aircraft engines. A discrepancy between the benzpyrene emission characteristics is found for the two engines, which is as yet unexplained; in one case, the benzpyrene emission characteristics are proportional to those of smoke and CO, in the other case, they are not. B.J.

A82-26495 † Methodology for determining fuel-combustion efficiency and the toxicity of exhaust gases (K metodike opredeleniia polnoty sgoraniia topliva i toksichnosti vykhlopnykh gazov). V. P. Lukachev and A. V. Ivliev. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 96-99. In Russian.

Methodological questions relating to the experimental determination of the combustion efficiency of jet-engine fuels and the toxicity of the exhaust gases are discussed. Particular consideration is given to the sampling of combustion products and to the elimination of low-frequency fluctuations of combustion-product composition. B.J.

A82-26496 † Analysis of the characteristics of a bypass engine, with allowance for variable pressure losses in the channels (Raschet kharakteristik TRDD s uchetom peremennykh poter' davleniia v kanalakh). B. D. Fishbein. *Aviatsionnaia Tekhnika,* no. 3, 1981, p. 99-102. In Russian.

A82-26500 † Radio-navigation equipment of aircraft - Devices and operation (Radionavigatsionnoe oborudovanie samoletov - Ustroistvo i ekspluatatsiia). A. N. Goliak, S. I. Plotkin, and I. F. Koval'chuk. Moscow, Izdatel'stvo Transport, 1981. 248 p. 7 refs. In Russian.

An automatic direction finder is described, taking into account general information, the goniometric system, aspects of control, the automatic tuning system, and operational details. A radio altimeter is also considered, giving attention to the high-frequency measuring device, the amplifier of the difference frequency, the transceiver unit, the altitude indicator, and details regarding the operation of the instrument. Another instrument discussed has been designed to provide air navigation on the basis of a utilization of the international VOR system and the Instrument Landing Systems. Aspects of approach control for the aircraft during landing operations are examined along with questions of instrument control, operational principles, and instrument design. A description is also provided of aircraft radio-navigation equipment employed for an automatic, continuous measurement and indication of the polar coordinates of the aircraft. G.R.

A82-26511 Automating air-traffic control. H.-M. D. Toong (MIT, Cambridge, MA) and A. Gupta. *Technology Review,* vol. 85, Apr. 1982, p. 40-49, 54. 5 refs.

The present air-traffic control system based on 1960s technology that uses redundancy to deal with random interruptions of service is being modernized for the 1990s. The system has become increasingly unreliable with obsolete hardware lacking sufficient memory space, and degrading computer response time. The FAA has proposed replacing selected pieces of existing hardware with functionally similar hardware ('rehosting'), but which would increase capacity with minimal software modification. Only basic computer instructions would be required. Communications facilities would be modernized by transmitting computer-generated instructions directly to the aircraft, reducing the involvement of air traffic controllers in this task. By 1996, the entire task of routing air traffic will be done with little human intervention, saving fuel and flying time. The cost of upgrading will be in the vicinity of $300 million, with a factor-of-ten increase over the current computer speed. C.D.

A82-26526 * # The role of modern control theory in the design of controls for aircraft turbine engines. J. Zeller, B. Lehtinen, and W. Merrill (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0320.* 32 p. 117 refs.

The development, applications, and current research in modern control theory (MCT) are reviewed, noting the importance for fuel-efficient operation of turbines with variable inlet guide vanes, compressor stators, and exhaust nozzle area. The evolution of multivariable propulsion control design is examined, noting a basis in a matrix formulation of the differential equations defining the process, leading to state space formulations. Reports and papers which appeared from 1970-1982 which dealt with problems in MCT applications to turbine engine control design are outlined, including works on linear quadratic regulator methods, frequency domain methods, identification, estimation, and model reduction, detection, isolation, and accommodation, and state space control, adaptive control, and optimization approaches. Finally, NASA programs in frequency domain design, sensor failure detection, computer-aided control design, and plant modeling are explored. M.S.K.

A82-26536 A310 - Europe builds on Airbus success. D. Velupillai. *Flight International,* vol. 121, Feb. 27, 1982, p. 477-484.

Some of the overall problems of the Airbus A310 as well as design details of its new wing are discussed. The wing has the same sweep as the A300 wing and similar slats and flaps. Greater supercriticality was achieved, with consequent reduced airfoil size and thicker section without drag penalty. A 3-D airflow analysis showed that large spanwise changes in airfoil-section were necessary, which in turn demanded extensive double curvature in the lower skin of the inner wing, produced by a new shot-peening technique. 3-D analysis was also used to optimize wing twist along the span and to minimize downward lift generated by the tail-plane during cruise. Detail improvements were made in the leading-edge slats and flaps, the outboard ailerons were eliminated, and other drag clean-ups were made. The spanwise skin-joint is now outboard and will later be eliminated. In the rest of the airframe there is minimum change. The A310 is designed for crack-free life of 20,000 flights, or about 10 years of service. Some comparisons are made with the Boeing 767 and 757 and fuel consumption, production line and cockpit details are also given. C.D.

A82-26537 **Advanced helicopter concepts compete.** G. Warwick. *Flight International,* vol. 121, Mar. 13, 1982, p. 615, 616, 625, 626.

The U.S. Army is defining a tri-Service medium-lift V/STOL aircraft for the early 1990s, with advancing-blade, tilt-rotor, and X-wing concepts among the contenders. One way to increase helicopter speed is to install a pair of coaxial counter-rotating rotors so that all lift is generated on opposing advancing blades. This enables retreating blades to operate at low or zero pitch. Helicopter speed can be increased by avoiding edgewise flow; this is done by tilting the rotors forward into the airflow to become large-diameter propellers and transferring lift to a fixed wing. Speeds of 300 kt at sea level and 350 kt at 20,000 ft are achieved. The key to X-wing is circulation control. The blades have an elliptical section with rounded leading and trailing edges. Air pumped into the hollow blades exits through narrow slots running the length of the upper surface at 5% and 95% chord. Blowing reduces drag and produces lift essentially independent of blade pitch and airflow velocity. Speeds of 500 kt have been attained. C.D.

A82-26538 **From claws to jaws - Tiger into Tigershark.** R. Braybrook. *Air International,* vol. 22, Mar. 1982, p. 111-116, 136-138.

Northrop began considering lightweight low-cost fighters in the early 1950s, building a series leading to the F-5s. These aircraft combined twin-engine safety with straightforward handling characteristics and the infrared guidance missiles gave these aircraft an effective air combat role. The F-5A was a basic fighter that gave poorer nations an introduction to supersonics at low prices, while the F-5E was a more powerful short-range air superiority fighter with ground attack capability. The F-5G Tigershark features the F404 engine with 16,390 lb of afterburning thrust, a flattened nose shape to maintain excellent handling qualities at high angle of attack, enlarged leading edge extension and improved longitudinal control. Much of the operational equipment will be that of the F-5E, but add-on or alternative equipment will soon be available. The first flight is scheduled for September 1982. C.D.

A82-26541 # **Structural design and construction of the New Technology Wing.** M. Flemming. *Dornier-Post* (English Edition), no. 4, 1981, p. 14-18.

The New Technology Wing (NTW) for general aviation aircraft uses milling for the rib flanges as well as the skin/stringer panels, providing a very smooth outside contour which improves the aerodynamic quality of the wing. The need for about 12,000 rivets is eliminated as well as the possibility of leaks that rivets entail. Only about ten percent more milling time is required by the NTW. To compress the rib flange, the usual shot peening method is inadequate. Instead, the flange is formed by two or three applications of a hand compression tool at opposite nodes of the flange all along its length. This technique causes permanent tensile stresses that could cause tension crack corrosion during extended operation. Qualifying tests are therefore envisioned in sensitive materials. No negative effects are expected with respect to fatigue, and tests confirm this. The entire wing is simply assembled and includes a lighter trailing edge box made of fiberglass reinforced plastic sandwich structures with plastic honeycombs. C.D.

A82-26542 # **Experimental program for general aviation.** W. Haberland. *Dornier-Post* (English Edition), no. 4, 1981, p. 19-22.

The New Technology Wing Program involved the design, construction, and testing of a representative wing having a novel aerodynamic profile and slotted flaps to improve maximum lift and L/D ratios, suitable wing edges to reduce induced drag, and wing design allowing cost-efficient production. More than 200 successful test flights have demonstrated 25%-40% improvement in range and 30% reduction in fuel consumption when cruising at 400 km/h, compared to conventional aircraft having the same engines and payload. The tests, which apply to both single-engine and twin-engine planes, showed that the aircraft could climb from high airfields at full payload even when one engine fails. Production cost for the wing box was reduced about 30%. C.D.

A82-26543 # **One year flight testing of the Transonic Wing.** B. Mosken. *Dornier-Post* (English Edition), no. 4, 1981, p. 38-43.

Flight testing of the Dornier Transonic Wing (TW) on the Alpha Jet A1 test bed is described. The experimental version of the TW is characterized by its transonic profile with a large leading-edge radius, a relatively flat surface curvature of the front profile, and a more pronounced camber in the rear profile. The geometrical features of the wing provide higher cruise speed, more lift or payload, and - at higher profile thickness - a correspondingly reduced structural weight and more fuel volume, depending on the design requirement. Industrial and military flight tests were made and showed that the TW provides lower fuel consumption, particularly at high Mach numbers. The TW's radius of action is improved compared to conventional wing designs. Lower corner speed is considerably reduced and upper corner speed is heightened. Stall behavior is excellent. C.D.

A82-26587 * # **Sonic fatigue testing of an advanced composite aileron.** J. Soovere (Lockheed-California Co., Burbank, CA). *(American Institute of Aeronautics and Astronautics, Dynamics Specialists Conference, Atlanta, GA, Apr. 9, 10, 1981, Paper 81-0634.) Journal of Aircraft,* vol. 19, Apr. 1982, p. 304-310. Contract No. NAS1-15069.

The sonic fatigue test program to verify the design of the composite inboard aileron for the L-1011 airplane is described. The composite aileron is fabricated from graphite/epoxy minisandwich covers which are attached to graphite/epoxy front spar and ribs, and to an aluminum rear spar with fasteners. The program covers the development of random fatigue data by means of coupon testing and model studies on a representative section of the composite aileron, culminating in the accelerated sonic fatigue proof test. The composite aileron sustained nonlinear panel vibration during the proof test without failure. Viscous damping coefficients as low as 0.4% were measured on the panels. The effects of moisture conditioning and elevated temperature on the random fatigue life of both undamaged and impact damaged coupons were investigated. The combination of impact damage, moisture, and a 180 F temperature could reduce the random fatigue life by 50%. (Author)

A82-26588 # **Fuel optimal trajectory computation.** J. W. Burrows (Boeing Computer Services Co., Energy Technology Applications Div., Seattle, WA). *Journal of Aircraft,* vol. 19, Apr. 1982, p. 324-329. 8 refs.

Roughly a quarter of the total fuel savings of the new generation of large jet transports will come from the capability of computing fuel optimal flight trajectories between departure point and destination. The shape of the trajectory in the vertical plane is treated here. A simplified mathematical model is described including spline fits to the drag and fuel flow functions. A suboptimal trajectory is found using the maximum principle of optimal control and singular perturbation theory. The inner or boundary-layer solutions are identified as the climb or descent segments of the flight, while the outer solution corresponds to cruise. The inner solutions are expanded to second order in the vicinity of the outer solution to develop cruise control laws for cost-effective response to altered in-flight conditions. (Author)

A82-26589 # **Wing/control surface flutter analysis using experimentally corrected aerodynamics.** C. D. Turner (North Carolina State University, Raleigh, NC). *Journal of Aircraft,* vol. 19, Apr. 1982, p. 342-344. 11 refs. Research supported by the Beech Aircraft Corp.

In previous studies related to the flutter problem concerning aircraft, it appeared that results based on the use of theoretical

A82-28149 The status of airport noise prediction, with special reference to the United Kingdom and Europe. J. B. Large and M. E. House (Southampton, University, Southampton, England). *Noise Control Engineering,* vol. 17, July-Aug. 1981, p. 38-44. 12 refs.

The current status of airport noise prediction is reviewed with reference to both air-to-ground noise and near-ground noise such as noise generated by road traffic, auxiliary power units, engine ground running, approaching aircraft, and aircraft on taxiways and aprons. Methodologies for contour calculation and assessment are outlined, and areas for further study and refinement of procedures are indicated. In particular, the need for greater accuracy is emphasized in assessments made for legislative and statutory purposes. V.L.

A82-28150 The impact and future direction of aircraft noise certification. M. J. T. Smith (Rolls-Royce, Ltd., Derby, England). *Noise Control Engineering,* vol. 18, Mar.-Apr. 1982, p. 52-61. 17 refs.

After an historical account of the takeoff and landing noise problems created by the introduction of jet aircraft, and the aircraft noise footprint control requirements formulated by such regulatory bodies as the International Civil Aviation Organization in response to airport community demands, attention is given to the performance parameters determining the contours of aircraft noise footprints and the procedures for their quantification. It is suggested that computed noise contour dimensions be adjusted at the lateral, flyover and approach closure points to more accurately reflect aircraft noise emission characteristics, where presently such effects as shielding, forward speed and lateral attenuation cannot be defined from first principles to the degree of accuracy often assumed. It is emphasized that regulations must recognize aircraft manufacturer's exceeding even the lowest stipulated noise limits, and suitably reward them. O.C.

A82-28275 To the root of the problem - Some helicopter research topics. R. L. Maltby (Royal Aircraft Establishment, Farnborough, Hants., England). *Aerospace (UK),* vol. 9, Mar. 1982, p. 12-18. 10 refs.

A historical review is presented of the development of aircraft which can hover in flight and land vertically, beginning with the autogyro and proceeding through the aerodynamics of helicopter flight. Initial stability problems with the autogyro were overcome by separating the lift and propulsive functions, with a concomitant loss of vertical take-off ability. Glauert's method formulated an account of the edgewise flow of the blades in forward flight and defined the vortices for induced flow theory. Wake calculations were devised to describe the spiral disturbances each blade had to pass through from the preceeding blade's passage. Computers have allowed examination of surface pressures, blade motions, and surface strains in-flight, and wake studies with 17 pressure transducers on a blade of the Puma helicopter are described. Further discussion is given of blade dynamics, flight mechanics, particularly the man-machine interface, and air and ground resonance. M.S.K.

A82-28276 * # Why twin-fuselage aircraft. J. C. Houbolt (NASA, Langley Research Center, Hampton, VA). *Astronautics and Aeronautics,* vol. 20, Apr. 1982, p. 26-35. 8 refs.

Operational and design features of twin-fuselage aircraft are outlined, noting capabilities of transporting 100-400 passengers at subsonic speeds at an efficiency of around 190 passenger mi/gal. Wings for two body aircraft are lighter and are designed more from an aerodynamics point of view due to reductions in the bending moment. A 280 passenger configuration would need a 172 ft wingspan, compared to a 155 ft wingspan for a conventional aircraft, but the conventional wings would have a larger area. The higher aspect ratio contributed to the increased efficiency of the twin body operation. A lower wetted fuselage area is calculated for the two body aircraft with passenger capacities over 190, and twin fuselages are shown to have a higher passenger packaging density than double-deck widebodies. Finally, simple compounding of existing aircraft such as the DC-9 into a two-body shape is projected to offer a 1.9 factor increase in passenger mi/gal. M.S.K.

A82-28277 # Toward VLA air-cargo service. H. Liese (Dornier GmbH, Friedrichshafen, West Germany). *Astronautics and Aeronautics,* vol. 20, Apr. 1982, p. 36-41.

Trends and design possibilities for very large aircraft (VLA) for transporting containerized cargo are examined. Time losses in current air cargo transport are attributed to repacking necessities, uncoordinated manpower, insufficient personnel and facilities, and too little notification of shipments. Air transport costs more than sea transport, and also cuts the average delivery time by over 80%. It is noted that higher value goods, especially those requiring fast delivery, are shipped by air, for a fee averaging 1.8 that of sea routes. Comparison of conventional air transport to VLA transport of containerized cargo shows that use of VLA would increase air cargo share of containerized cargo to 43% of the total cargo shipped, compared with a present-day 5.9%. Necessities for a successful VLA-based air cargo system are reviewed, including a 1000 ton takeoff weight, sea- and land-basing options, and container interface with ground transport. M.S.K.

A82-28278 # Very large vehicles - Technology looking for a need. W. H. Arata, Jr. *Astronautics and Aeronautics,* vol. 20, Apr. 1982, p. 42, 43, 77. 26 refs.

Strategic and commercial incentives for the construction of very large vehicles (VLV) to be used for transporting massive air freight are considered. The acquisition and delivery of raw materials such as Al, beryn, Ti, and Mn, for which the U.S. and Europe are completely dependent on imports, are cited as driving commercial reasons for the development of VLVs. Military employment of a rapid deployment force is noted to depend on transferring troops and supplies to remote spots of the world in short time periods, a situation which would be strongly aided by the presence of Mach 0.8 vehicles in a twin-fuselage configuration capable of carrying 1000 tons. Finally, only the combination of military and commercial demand would be sufficient to ensure the economic viability of the development of VLVs. M.S.K.

A82-28280 * # Flying qualities - A costly lapse in flight-control design. D. T. Berry (NASA, Flight Research Center, Edwards, CA). *Astronautics and Aeronautics,* vol. 20, Apr. 1982, p. 54-57, 35.

Generic problems in advanced aircraft with advanced control systems which suffer from control sensitivity, sluggish response, and pilot-induced oscillation tendencies are examined, with a view to improving techniques for eliminating the problems in the design phase. Results of two NASA and NASA/AIAA workshops reached a consensus that flying qualities criteria do not match control system development, control system designers are not relying on past experience in their field, ground-based simulation is relied on too heavily, and communications between flying qualities and control systems engineers need improvement. A summation is offered in that hardware and software have outstripped the pilot's capacity to use the capabilities which new aircraft offer. The flying qualities data base is stressed to be dynamic, and continually redefining the man/machine relationships. M.S.K.

A82-28281 # VSTOLs - We can build them, but can we sell them. J. W. Flaig (U.S. Naval Air Systems Command, Washington, DC). *Astronautics and Aeronautics,* vol. 20, Apr. 1982, p. 58-61.

Conclusions regarding the development of a VSTOL wing for the Navy reached at the 2nd AIAA/NASA VSTOL Conference are reviewed. It was noted that a specific mission could not be designated for VSTOL aircraft and, subsequently, funds could not be dedicated to the program on a full-scale development level. Decreasing the margin of greater cost of the VSTOL aircraft to 16% rather than the current 25-30% more than conventional aircraft was recommended, along with finding specific scenarios which favor VSTOL employment. A solution was indicated in that VSTOL aircraft are capable of operating out of degraded field conditions, and also that faster deck cycling is possible. Further arguments favoring the use of VSTOL aircraft such as the AV-8B were that the response time for ground support is less than half that with conventional aircraft, and that VSTOL engines are hard to extinguish. M.S.K.

A82-28311 US Navy begins slow shuffle towards V/STOL. *Flight International,* vol. 121, Feb. 20, 1982, p. 419-421.

The US Navy is defining its next fighter/attack aircraft, and it is likely to be a V/STOL type. The design requirements include a sustained speed of Mach 1.6 or better, good STOL performance, high maneuverability, and take-off weight varying from 20,000 lb for VTO to some 40,000 lb for sea-based STO strike. McDonnell-Douglas submitted a vectored-thrust design featuring a turbofan engine producing 34,000 lb with plenum chamber burning, up to Mach 2 speed, VTO weight of 29,840 lb for 103 nm combat radius. Rockwell and General Dynamics based their designs on thrust augmentors. The former uses ejector flaps; the design augmentation ratio is 1:5:1 for 20,730 lb dry installed thrust, VTO weight is 24,000 lb, STO is 29,400 lb and combat radius is 300 nm. General Dynamics' design is 37,770 lb, 21, 800 lb VTO, Mach 1.6 maximum. The Vought is 25,330 lb VTO with a tandem-fan engine combining low-bypass cruise properties with medium-bypass air flow for V/STOL. C.D.

A82-28312 **Advancing blade flight data gathered.** D. E. Fink. *Aviation Week and Space Technology*, vol. 116, Mar. 29, 1982, p. 42-44, 47.

Stability and maneuverability characteristics gathered during 200 hours of flight tests are given for the XH-59A advancing blade concept (ABC) technology demonstration aircraft, which combines twin counterrotating helicopter rotors for vertical lift with turbojets for high forward speeds. The development of the aircraft is pertinent to both the U.S. Army's 1990s requirement for advanced attack helicopters and the market for intercity commuter aircraft of sufficiently low noise emission characteristics. The control response of the XH-59A in rolling into and out of steep turns is found to be comparable to that of fixed-wing aircraft. The forward thrust available from the auxiliary engines and differential collective of the rotors eliminates the need to pitch the main rotor tilt vector forward for high-speed, level flight. O.C.

A82-28313 **Precision casting for gas turbine engines.** C. W. Foster (Rolls-Royce, Ltd., London, England). *Aircraft Engineering*, vol. 54, Feb. 1982, p. 11-14.

The paper describes the gas turbine casting process in detail. High-temperature creep resistance is the property whose desirability most advances casting and materials technology. Vacuum melting and casting, directionally solidified (DS) casting, equi-axed and single-crystal casting are major developments in the progress of this technology. The vacuum process was used in the RB211-524 engine, while the DS process was employed in more advanced engines of the RB series. Rolls-Royce has built a new demonstration furnace whose melting unit, furnace chamber, withdrawal chamber, vacuum system, casting cycle, and control system are described. The future will bring increasing use of automation, production of more cast-to-size features, single-crystal castings application and process developments that will produce complex internal cooling configurations that are impossible today. C.D.

A82-28318 **An investigation of the swirl in an S-duct.** R. W. Guo and J. Seddon. *Aeronautical Quarterly*, vol. 33, Feb. 1982, p. 25-58. 7 refs.

Measurements are presented of the static pressure, total pressure, swirl and three-dimensional turbulence in the flow through an S-curved rectangular duct mounted in a wind tunnel at different incidences, yaw angles and mass flow ratios. The results show that at high incidence there is a large vortex around an area of flow separation after the first bend and a pair of contra-rotating vortices in the flow after the second bend. The distortion of total pressure at the exit of the S-duct is significantly high, and the corresponding three-dimensional turbulence is up to 16.7%. Appreciation of the existence of this type of flow is important in the field of air intake design for jet aircraft. (Author)

A82-28322 * # **Performance degradation of propeller/rotor systems due to rime ice accretion.** K. D. Korkan (Texas A & M University, College Station, TX), L. Dadone (Boeing Vertol Co., Philadelphia, PA), and R. J. Shaw (NASA, Lewis Research Center, Cleveland, OH). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0286*. 14 p. Grants No. NAG3-109; No. NAG3-242.

A theoretical model has been established which is applicable to both propeller and helicopter systems that determines the effect of rime ice accretion on the thrust coefficient, power coefficient, and efficiency as a function of time in a natural icing condition. Theoretical comparisons have been made with experimentally determined decrease in propeller thrust coefficient and efficiency for five natural icing conditions with good agreement. The present analytical model is also applicable to the helicopter case, where the method predicts radial and azimuthal rotor blade ice shapes in addition to torque rise as a function of time in a natural icing condition. (Author)

A82-28349 **The characteristics and detection of low level wind shear in the critical phases of flight.** P. D. Simmons. *The Controller*, vol. 21, Mar. 1982, p. 16-18.

Wind shear, defined as a change in wind speed and/or direction per unit distance between two points in the atmosphere, can precipitate a change in aircraft airspeed or other flight characteristic which, in extreme cases, may be uncorrectable by even maximum use of pilot maneuver and power controls. While micro scale shears cause only rapid turbulence and synoptic scale shears change flight conditions more slowly than would be hazardous, meso scale shears at low levels and in either vertical or horizontal directions pose considerable danger to aircraft during their landing glide path. Horizontal wind shear, which is often more powerful than the vertical and effectively reverses wind direction, has been identified as the greater threat. The relationship of wind shear to thunderstorm activity on a global scale is considered. O.C.

A82-28395 # **Effect of contrast on space perception in TV displays of the external scene observed by the pilot (Einfluss des Kontrastes auf die Raumwahrnehmung bei TV-Flugaussensichtdarstellungen).** H. Heising. Wachtberg-Werthhoven, West Germany, Forschungsinstitut für Anthropotechnik (Forschungsinstitut für Anthropotechnik, Bericht, No. 50), 1981. 80 p. 16 refs. In German.

Procedures involving the simulation of the external visual scene perceived by the conductor of a vehicle are, in particular, employed in connection with flight simulation applications for training, research, and development programs. Heising (1977) has reported the development of a simulating device based on a raster formation approach. Every individual image obtained previously in connection with the TV recording of a flight maneuver is modified in such a way that it appears to the person in the simulator in the correct perspective with respect to his position. There are, however, variations in contrast in connection with the image processing operations. An investigation is, therefore, conducted concerning the effects of the contrast changes on space perception. It is found that aspects of positional perception are not affected by the considered contrast variations. It appears, therefore, that the contrast variations do not cause changes with respect to details of space perception. G.R.

A82-28397 **Simple vs. sophisticated TacAir avionics. II - Soviet TacAir avionics technology.** J. Bussert. *Military Electronics/Countermeasures*, vol. 8, Mar. 1982, p. 56-62.

An historical study is presented of Soviet tactical aircraft avionics developments, encompassing radars, ECM ordnance, communications and cockpit instrumentation. It is noted that (1) there has been a marked shift since 1970 from interceptor to ground support aircraft development and production, (2) that ostensibly obsolete electronics such as the MiG-25 vacuum tube-based Foxfire radar may exploit low vulnerability and exceptionally high power levels, and (3) that the simplicity of Soviet avionics design imposes a lower acquisition and maintenance cost burden while increasing reliability and the trainability of crews. It is suggested that the Soviet study of F-14 Phoenix missile systems since the Iranian revolution has been instrumental in the development of a MiG-25 two-seat variant with anti-cruise missile look down/shoot down capability. O.C.

A82-28403 **Real-time failure detection of aircraft engine output sensors.** C. W. de Silva. *Arabian Journal for Science and Engineering*, vol. 7, Jan. 1982, p. 45-53. 9 refs.

The Bayesian approach to hypothesis testing in failure detection the structural design criteria for aircraft which will be subjected to hush house operation or defining requirements for associated equipment. Recommendations were also made to increase the fatigue life of the aft fuselage. Author (GRA)

N82-21042# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.
ACOUSTIC MEASUREMENTS OF F-15 AIRCRAFT OPERATING IN HUSH HOUSE, NSN 4920-02-070-2721 Final Report, May - Sep. 1981
Vincent R. Miller, G. A. Pizak, and J. M. Chinn Sep. 1981 117 p refs
(AD-A109828; AFWAL-TM-81-82-FIBE/FIBG) Avail: NTIS HC A06/MF A01 CSCL 20/1

The purpose of this test program was to measure the acoustic environment in the hush house facility located at Kelly Air Force Base, Texas, during operation of the F-15 aircraft to ensure that aircraft structural acoustic design limits were not exceeded. The acoustic measurements showed that no potential sonic fatigue problems are anticipated with the F-15 aircraft structure during operation in the hush house. However, since these acoustic levels were increased over those measuring during run up on a concrete pad, it is recommended that F-15 equipment qualification levels be checked. The data indicated that the noise field within the hush house is diffuse and that the acoustical energy in the hangar area is radiated from the region between the engine exhaust and the hush house muffler front edge toward the forward part of the hangar. Author (GRA)

N82-21043# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.
ACOUSTIC MEASUREMENTS OF F-16 AIRCRAFT OPERATING IN HUSH HOUSE, NSN 4920-02-070-2721 Final Report, May - Sep. 1981
Vincent R. Miller, G. A. Pizak, and J. M. Chinn Sep. 1981 110 p refs
(AD-A109829; AFWAL-TM-81-83-FIBE/FIBG) Avail: NTIS HC A06/MF A01 CSCL 20/1

The purpose of this test program was to measure the acoustic environment in the hush house facility located at Kelly Air Force Base, Texas, during operation of the F-16 aircraft to ensure that aircraft structural acoustic design limits were not exceeded. The acoustic measurements showed that no sonic fatigue problems are anticipated with the F-16 aircraft aft fuselage structure during operation in the hush house. The measured acoustic levels were less than those measured in an F-16 aircraft water cooled hush house at Hill AFB, but were increased over that measured during ground run up. It was recommended that the acoustic loads measured in this program should be specified in the structural design criteria for aircraft which will be subjected to hush house operation or defining requirements for associated equipment.
Author (GRA)

N82-21054*# Cornell Univ., Ithaca, N. Y. Dept. of Astronomy.
THE SIXTEEN TO FORTY MICRON SPECTROSCOPY FROM THE NASA LEAR JET Final Technical Report, 1 Oct. 1970 - 31 Oct. 1980
J. R. Houck Mar. 1982 63 p refs
(Grant NGR-33-010-182)
(NASA-CR-168684; NAS 1.26:168684) Avail: NTIS HC A04/MF A01 CSCL 20F

Two cryogenically cooled infrared grating spectrometers were designed, fabricated and used on the NASA Lear Jet Observatory. The first spectrometer was used to measure continuum sources such as dust in H II regions, the galactic center and the thermal emission from Mars, Jupiter, Saturn, and Venus over the 16 to 40 micron spectral range. The second spectrometer had higher resolution and was used to measure ionic spectral lines in H II regions (S III at 18.7 microns). It was later used extensively on NASA C-141 Observatory to make observations of numerous objects including H II regions, planetary nebulae, stars with circumstellar shells, the galactic center and extragalactic objects. The spectrometers are described including the major innovations and a list of the scientific contributions. S.L.

N82-21139*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROCEEDINGS: FIFTH ANNUAL WORKSHOP ON METEOROLOGICAL AND ENVIRONMENTAL INPUTS TO AVIATION SYSTEMS
Dennis W. Camp, ed., Walter Frost, ed. (Tennessee Univ. Space Inst.), and Pamela D. Parsley, ed. Dec. 1981 149 p refs
Workshop held at Tullahoma, Tenn., 30 Mar. - 1 Apr. 1981; sponsored by NASA, NOAA and FAA
(Contract NAS8-32692)
(NASA-CP-2192; NAS 1.55:2192; FAA-RD-81-67) Avail: NTIS HC A07/MF A01 CSCL 01B

Aviation safety, meteorology, air traffic control, training, flight operations, general aviation, and aviation weather research and services were examined in an effort to expand understanding and knowledge of the interaction of the atmosphere with aviation systems, better define and implement services to operators, and to collect and interpret data for establishing operational criteria relating the total meteorological inputs from the atmospheric sciences to the needs of aviation communities. For individual titles, see N82-21140 through N82-21152.

N82-21140*# Federal Aviation Administration, Washington, D.C. Energy Div.
METEOROLOGICAL IMPACT ON AVIATION FUEL EFFICIENCY
David E. Winer and John E. Wesler *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 15-19 refs

Avail: NTIS HC A07/MF A01 CSCL 01C

The connection between fuel consumption and weather data is discussed. Fuel efficient flights creating adequate near real time weather information are examined. The lack of highly resolved real time and near real time wind and temperature data at flight altitudes is investigated. The existing systems, which is based on twice a day balloon observations, supplemented by pilot reports or other occasional data, is not adequate for optimum flight planning. The impacts of upper winds and temperatures on fuel efficiency and flight planning are not widely appreciated and developing new weather products are considered. E.A.K.

N82-21141*# McDonnell-Douglas Electronics Co., St. Charles, Mo.
METEOROLOGICAL INPUTS TO ADVANCED SIMULATORS
Gordon O. Handberg *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 21-25 refs

Avail: NTIS HC A07/MF A01 CSCL 14B

Weather simulation as it is currently implemented and some suggestions and questions considered in future simulator developments are described. Flight simulators represent weather in a considerably broader sense and with an almost limitless capability for future expansion. Realistic weather is important in pilot training simulators. It offers promising opportunity to provide training because it permits an element of environmental control not available in the real world. E.A.K.

N82-21142*# USAir, Pittsburgh, Pa.
OPERATIONAL PROCEDURES RELATIVE TO SEVERE WEATHER
James F. Sullivan *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 26-28

Avail: NTIS HC A07/MF A01 CSCL 01C

Severe weather impact on both safety and the economics of all types of aviation, and reduction of elimination are discussed. The functions and responsibilities of the dispatcher are outlined. All surface weather reports showing inclement weather, SIGMET REPORTS, forecasting turbulence or icing, convective SIGMETS: (1) tornadoes; (2) hail 3/4 of an inch or greater; (3) imbedded thunderstorms; (4) squall lines or (5) an area of level four or greater thunderstorms. This information along with PIREPs of severe weather are relayed to affected flights. It is concluded that operational procedures must be timely and well conceived to assure the least amount of impact on airline operations.
E.A.K.

N82-21143*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METEOROLOGY IMPACT ON FUTURE AIRCRAFT DESIGN

Joseph W. Stickle *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to

Aviation Systems Dec. 1981 p 29-34

Avail: NTIS HC A07/MF A01 CSCL 01C

Meteorology impact on future aircraft design is discussed. Upcoming changes in both design and operations that will be influenced by the meteorological environment are outlined. Future and more nonconventional designs and meteorological impact brought about by operational changes over the next few years are examined. E.A.K.

N82-21144*# Federal Aviation Administration, Washington, D.C. Systems Research and Development Div.
METEOROLOGY IMPACT ON ATC SYSTEM DESIGN
Frank E. VanDemark *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 35-39

Avail: NTIS HC A07/MF A01 CSCL 17G

The impact of meteorology on air traffic control (ATC) system design for designs, and for cost benefit evaluations is discussed. The myriad of choices for implementation is a problem of great magnitude, given the economic climate of today. Cost versus benefit requires greater emphasis. Expanding and improving weather data acquisition, increasing the speed of weather data transmission and automating those actions that lend themselves to standardization for automated data processing are outlined. Three programs are mentioned: (1) automated weather observations, (2) weather radar and improvements to the national airspace system as related to the handling of weather data; and (3) products. E.A.K.

N82-21145*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OZONE AND AIRCRAFT OPERATIONS
Porter J. Perkins *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 40-44 refs

Avail: NTIS HC A07/MF A01 CSCL 04A

The cabin ozone problem is discussed. Cabin ozone in terms of health effects, the characteristics of ozone encounters by aircraft, a brief history of studies to define the problem, corrective actions taken, and possible future courses of action are examined. It is suggested that such actions include avoiding high ozone concentrations by applying ozone forecasting in flight planning procedures. E.A.K.

N82-21146*# National Aeronautics and Space Administration, Washington, D. C.
NASA RESEARCH PROGRAMS RESPONDING TO WORKSHOP RECOMMENDATIONS
A. Richard Tobiason *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 58

Avail: NTIS HC A07/MF A01 CSCL 01B

The atmospheric electricity and lightning committee forecasts lightning and dissemination of information on the probability of occurrance. A data source with the F-106 flight program was established. The objective is to improve the detectability of lightning and severe storms and help develop operational avoidance procedures and to study the use of satellite and Doppler radar to detect thunderstorms and forecast the probability of lightning. Three recommendations are made: (1) to establish a national flying lightning laboratory; (2) strike models are considered and to gather strike data; (3) to find the best way to apply electrical field data to operations. E.A.K.

N82-21147*# Naval Research Lab., Washington, D. C.
PROGRESS ON LOW ALTITUDE CLOUD ICING RESEARCH
Richard K. Jeck *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 59-63 refs Prepared in cooperation with Naval Academy

Avail: NTIS HC A07/MF A01 CSCL 04B

The icing environment at altitudes below 10,000 feet were studied. The following questions are asked, are: (1) existing aircraft certification criteria applicable; (2) too stringent on icing for helos; (3) based on accurate data; (4) appropriate for low (10,000 ft) altitudes? The research plan is outlined: review historical icing data, obtain new measurements, collect modern icing data from other groups, and recommend LWC, OAT, and MVD criteria for helicopters. Estimated accuracies and known sources of error are included. It is concluded that the net effect of possible sources of error of both signs is uncertain. E.A.K.

N82-21148*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NASA/LEWIS RESEARCH CENTER ICING RESEARCH PROGRAM
Peggy L. Evanich *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 64-75

Avail: NTIS HC A07/MF A01 CSCL 01C

Icing requirements for commercial aircraft, light transport and general aviation aircraft, and rotorcraft were studied. The objectives was to: establish the state of the art in aircraft icing, determining the aircraft industry's icing research and technology needs, and recommending both short and long term icing programs to NASA. It is shown that all three categories of aircraft need improved and new ice protection system, icing calculational techniques, icing performance sensitivity on current and modern airfoils, and new and improved icing facilities. The need for a general aviation pilot training film concerning flight into icing conditions is also identified. E.A.K.

N82-21149*# Dayton Univ., Ohio.
EFFECT OF HEAVY RAIN ON AIRCRAFT
James K. Luers *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 76-80

Avail: NTIS HC A07/MF A01 CSCL 01C

A summary on heavy rain effects on aircraft aerodynamics validation of research and some wind shear accidents in which heavy rain were an important factor. Frost formation and what frost does to the lift and drag curves for an airfoil was examined. If frost could cause severe aerodynamic problems for both general aviation and transport aircraft due to its roughness, then heavy rain produce a similar result. The influencing parameters of heavy rain on an aircraft are studied. Sources of aerodynamic roughness due to rain and wind shear and heavy rain accidents are outlined. E.A.K.

N82-21150*# Federal Aviation Administration, Washington, D.C.
PROTOTYPE REGIONAL OBSERVATION AND FORECAST SYSTEM (PROFS)
John W. Hinkelman, Jr. *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 81-85

Avail: NTIS HC A07/MF A01 CSCL 04B

The prototype regional observation and forecast system (PROFS) outputs are demonstrated, functional design specifications to be used to procure and implement operational systems are outlined. Advanced candidate technologies are evaluated as an integral part of the process that leads to these outputs. Evaluation insures that future weather service systems will contain the optimum mix of technologies to be most cost effective in reducing the annual losses and deaths that are directly attributed to severe weather. E.A.K.

N82-21152*# National Center for Atmospheric Research, Boulder, Colo.
THE JOINT AIRPORT WEATHER STUDIES PROJECT
John McCarthy *In* NASA. Marshall Space Flight Center Proc.: 5th Ann. Workshop on Meteorol. and Environ. Inputs to Aviation Systems Dec. 1981 p 91-95
Avail: NTIS HC A07/MF A01 CSCL 04B

A block diagram of the joint airport weather studies program is presented. Background leading to the development of the program is reviewed. Basic studies, aircraft performance, and detection and warning techniques used to develop fine scale structure of thunderstorm dynamics and kinematics in the vicinity of a major airport; effect of thunderstorm low level wind shear on aircraft performance; and development of real time testing of low level wind shear detection and warning techniques and displays are described. E.A.K.

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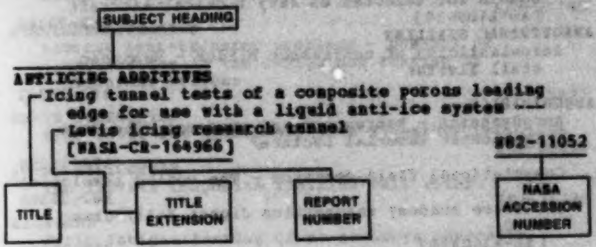
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[NASA-CR-165818] N82-21532

unsteady aerodynamics might not always represent the actually existing conditions. In an investigation of the reported difficulties, an analytical flutter model of the experimental model used by Forsching et al (1971) was developed. In order to correct the wing/control surface aerodynamics a matrix method recommended by Rodden was applied to the analytic aerodynamic data. This approach made it possible to use the experimental pressure with the analytical flutter model. Results obtained with the analysis involving the corrected aerodynamics are compared with the data provided by the uncorrected model. G.R.

A82-26620 * **Helicopter vibration suppression using simple pendulum absorbers on the rotor blade.** M.-N. H. Hamouda and G. A. Pierce (Georgia Institute of Technology, Atlanta, GA). *American Helicopter Society, National Specialists Meeting on Helicopter Vibration, Hartford, CT, Nov. 2-4, 1981, Paper.* 15 p. 10 refs. Grant No. NsG-1592.

A design procedure is presented for the installation of simple pendulums on the blades of a helicopter rotor to suppress the root reactions. The procedure consists of a frequency response analysis for a hingeless rotor blade excited by a harmonic variation of spanwise airload distributions during forward flight, as well as a concentrated load at the tip. The structural modeling of the blade provides for elastic degrees of freedom in flap and lead-lag bending plus torsion. Simple flap and lead-lag pendulums are considered individually. Using a rational order scheme, the general nonlinear equations of motion are linearized. A quasi-steady aerodynamic representation is used in the formation of the airloads. The solution of the system equations derives from their representation as a transfer matrix. The results include the effect of pendulum tuning on the minimization of the hub reactions. C.R.

A82-26630 **A simple crack closure model for prediction of fatigue crack growth rates under variable-amplitude loading.** A. U. de Koning (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands). In: Fracture mechanics; Proceedings of the Thirteenth National Symposium, Philadelphia, PA, June 16-18, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 63-85. 17 refs. Research supported by the Nederlands Instituut voor Vligtuigontwikkeling en Ruimtevaart.

A relatively simple model accounting for load interaction effects as well as for the plane strain to plane stress transition has been developed for the analysis of fatigue crack growth in aluminum alloys. The model is based on an approximate description of the crack closure behavior and can be used to predict effects of crack growth acceleration and retardation observed experimentally under variable-amplitude loading. The model has been used successfully to analyze the effect of parameter variations in a flight simulation load spectrum on the crack growth rate in centrally cracked specimens cut from 7075-T6 sheet material. V.L.

A82-26637 **Fracture mechanics technology applied to individual aircraft tracking.** A. G. Denyer (Rockwell International Corp., El Segundo, CA). In: Fracture mechanics; Proceedings of the Thirteenth National Symposium, Philadelphia, PA, June 16-18, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 288-302.

A tracking program being prepared for the USAF T-39 Utility Trainer which uses crack growth principles for both durability and damage tolerance life estimates is discussed. The tracking program consists of defining the structural life of aircraft and the corresponding crack growth limits, selecting the critical structural locations to be tracked, collecting flight records from the aircraft fleet, and performing crack growth analysis using the flight records to obtain the accumulated damage and an estimate of the remaining life. A cost-effective crack growth integration technique which makes tracking for durability feasible even if the life is as much as 100,000 hr is presented. V.L.

A82-26639 **Fracture control in ballistic-damaged graphite/epoxy wing structure.** J. G. Avery, S. J. Bradley, and K. M. King (Boeing Military Airplane Co., Seattle, WA). In: Fracture mechanics; Proceedings of the Thirteenth National Symposium, Philadelphia, PA, June 16-18, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 338-359. 6 refs. DOD-sponsored research.

A graphite/epoxy wing skin configuration has been developed which is capable of sustaining limit load after being hit by a 23-mm high-explosive-incendiary projectile under worst-case damage conditions. The skin configuration consists of a 45-deg cross-ply graphite/epoxy laminate with integral spanwise and chordwise crack-arresting pads formed by adding 0-deg glass/epoxy between the graphite/epoxy plies. The 45-deg orientation provides enhanced battle damage tolerance because of its higher residual strain-to-fracture capability relative to quasi-isotropic 0/+ or - 45/90 laminates. The fracture control approach has been successfully demonstrated for a full-scale component. V.L.

A82-26652 **Evaluation of crack growth gages for service life tracking.** C. R. Saff (McDonnell Aircraft Co., St. Louis, MO) and D. R. Holloway (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Fracture mechanics; Proceedings of the Thirteenth National Symposium, Philadelphia, PA, June 16-18, 1980. Philadelphia, PA, American Society for Testing and Materials, 1981, p. 623-639. 13 refs. Contract No. F42600-78-D-0014.

A82-26820 **Future helicopter technology.** R. B. Lewis, II (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *Vertiflite,* vol. 28, Mar.-Apr. 1982, p. 12-15.

Technological opportunities concerning helicopter developments are related to fuel efficient engines, composite airframes, digital avionics, optical flight controls, and advanced rotor concepts. The Army is currently formulating a comprehensive program for the 1980s and 1990s which will apply these technologies to a new Light Helicopter Family, a new Special Electronic Mission Aircraft, the Advanced Attack Helicopter, and the Modernized Chinook. Particular attention is given to aspects of digital systems integration, developments regarding an employment of composite materials, advances related to engine development, and details of rotor system design. G.R.

A82-26821 **The future of helicopter flight control technology.** R. Zincone (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *Vertiflite,* vol. 28, Mar.-Apr. 1982, p. 16-19.

Major opportunities for significant technological gains by the helicopter industry in the next decade are related to the rapid advances being made in digital microprocessor technology, optical transmission, and advanced control concepts. An investigation is conducted concerning the effects of the new developments on the civil helicopters of the 1990s. The impact of new control system technology is considered, taking into account aspects of improved performance, empennage size, fly-by-wire techniques, and cost effectiveness payoffs related to maintenance. Questions concerning increased pilot productivity and safety through reduced workload are discussed, giving attention to improved handling qualities, advanced cockpit technology, cockpit systems, cockpit controls, improved ride quality, and vibration suppression. Effects of the technologies on operator requirements are also examined. G.R.

A82-26822 **NOTAR.** A. H. Logan (Hughes Helicopters, Inc., Culver City, CA). *Vertiflite,* vol. 28, Mar.-Apr. 1982, p. 20-23.

The single-rotor helicopter owes much of its longevity to the successful use of the tail rotor concept as a means of counteracting the torque induced by the main rotor rotation. However, the tail rotor does have several drawbacks, and recent Army studies have shown that the tail rotor is responsible for 15 percent of all helicopter accidents, placing it second only to engine problems. In connection with efforts to develop an antitorque concept which eliminates the tail rotor, the No-Tail-Rotor (NOTAR) design was created. The new design employs a low pressure air system in place of a tail rotor. NOTAR promises to be a viable alternative to the tail rotor in operation while affording the helicopter pilot identical maneuvering capabilities. Attention is given to details of NOTAR system design, aspects of NOTAR development, and flight tests. G.R.

A82-26966 * **Large scale model measurements of airframe noise using cross-correlation techniques.** W. R. Miller, W. C. Meecham

(California, University, Los Angeles, CA), and W. F. Ahtye (NASA, Ames Research Center, Moffett Field, CA). *Acoustical Society of America, Journal,* vol. 71, Mar. 1982, p. 591-599. 22 refs. NASA-supported research.

Cross-correlation techniques are used to measure the sound radiated by wing/flap airfoil configurations in the NASA-Ames 40 x 80 ft wind tunnel using a 6.7-m semispan model with three deployed flaps. The dominant source of flap noise is identified as the flap side edges, which exceeds that radiated by the midspan region by more than 10 dB. The turbulent surface eddies at the flap side edge have scales on the order of one-half the flap chord. The installation of flap actuator fairings at the flap side edge reduces the noise radiated from that location by 10 to 15 dB. The cross-correlation technique extracts airframe noise radiated by specific surface locations from the tunnel background noise, even when the noise is 25 dB higher than the measured airframe noise level. D.L.G.

A82-26993 # **Aeroelasticity of compressor blades - Subsonic stall flutter.** H. Loiseau and E. Szechenyi (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Nov.-Dec. 1981, p. 47-69. 6 refs.

Studies carried out at ONERA concerning the aeroelasticity of turbomachine blades are described. Results relating to subsonic and transonic stall flutter are presented, and prediction calculations using experimental data from the wind tunnel are compared with damping and unsteady pressure measurements made in the corresponding compressor. The techniques for measuring the aeroelastic coefficients based on excitation by hydraulic actuators and measurement using transducers are found to be operational and efficient. Unsteady flow simulated in the wind tunnel is found to be well simulated from a quantitative point of view. It is concluded that the unsteady phenomena revealed by the wind tunnel tests are representative of real phenomena in compressors, and the steady flow conditions necessary for stall flutter have been established. D.L.G.

A82-27048 **Modernising air traffic control in France.** J. de Galard. *Airport Forum,* vol. 11, Feb. 1982, p. 29-34.

A description is given of the Coordonnateur Automatique du Trafic Aérien (CAUTRA) IV ATC system, which has been operating at Brest, France since 1980. CAUTRA IV uses a distributed system architecture, based on Mitra minicomputers, and incorporates as interconnected systems a centralized Initial Flight Plan Data Processing System, a Flight Plan Data Processor, and a Radar Data Processor for each enroute ATC center. There are five redundant data processing sets per center, which may be reconfigured through reconnection by means of a mixing and switching device to all synchronous interfaces supporting operational peripherals and external links. Attention is given to a computerized safety net system integrated into CAUTRA IV that is capable of automatically detecting a large percentage of threatened collisions and informing controllers. O.C.

A82-27049 **IATA's Unit Terminal Concept.** E. B. Tutty (International Air Transport Association, Technical Dept., Montreal, Canada). *Airport Forum,* vol. 11, Feb. 1982, p. 47-50.

An account is given of the airport design and development criteria formulated by the Airport Terminals Advisory Committee (ATAC) of the International Air Transport Association (IATA), which has undertaken studies of terminal units of exceptional design simplicity, smoothness of function and cost-effectiveness. These criteria are to be integrated in the forthcoming IATA Airport Terminals Reference Manual. Attention is given the Unit Terminal Concept, which has been supported by Lufthansa since the 1960s and used in the design of such airports as Cologne/Bonn, Hannover, and Berlin-Tegel with great success due to its ease of adjustment to meet novel requirements through the addition of terminal units as the need arises. O.C.

A82-27050 **The effects of weather on runway operations.** G. N. Steuart (Toronto, University, Toronto, Canada) and A. R. Gray (Urban Transport Development Co., Toronto, Canada). *Airport Forum,* vol. 11, Feb. 1982, p. 60-70. 10 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

It is established that all phases of runway operating conditions are more variable in poor than in good weather, and that, although average runway occupancy times may remain unchanged in some deteriorating weather conditions, effective performance is reduced because operations which depend on runway friction are significantly degraded. It is further determined that all aircraft touch down on a given runway at a location that bears a fixed relationship to a specific point, and that the position of this aiming point depends on the relative approach slope and primary exit taxiway location rather than on weather conditions. While pilots often adjust deceleration to compensate for inconvenient exit locations and thereby reduce runway occupancy times in good weather, this practice is not followed in poor weather. O.C.

A82-27068 # **Correlation of wear with oxidation of carbon-carbon composites.** H. W. Chang (Bendix Advanced Technology Center, Columbia, MD). In: Wear of materials 1981; Proceedings of the International Conference, San Francisco, CA, March 30-April 1, 1981. New York, American Society of Mechanical Engineers, 1981, p. 544-547. 6 refs.

The wear characteristics of carbon-carbon composites for aircraft brake materials are investigated using an inertial dynamometer. The wear rates are measured in terms of weight loss and thickness reduction. The wear rates in terms of weight loss are in all cases greater than those in terms of thickness reduction over a wide range of braking conditions. This difference is consistent with previous work done under a normal braking condition and, as before, is attributed to the oxidation of carbon on nonfriction surfaces. Good agreement is obtained between the activation energies for oxidation of carbon (29 kcal/mole) and for material loss on nonfriction surfaces (27 kcal/mole). C.R.

A82-27071 * # **Effect of mechanical surface and heat treatments on erosion resistance.** J. Salik and D. H. Buckley (NASA, Lewis Research Center, Cleveland, OH). In: Wear of materials 1981; Proceedings of the International Conference, San Francisco, CA, March 30-April 1, 1981. New York, American Society of Mechanical Engineers, 1981, p. 592-596. 8 refs.

The effect of erosion by glass beads and crushed glass and by heat treatments on the erosional resistance of 6061 aluminum alloy and 1045 steel were studied. The aluminum alloy's erosion resistance was found to be insensitive to mechanical surface treatment applied before testing, and was determined to depend on the properties of the work-hardened surface layer; this was also demonstrated for aluminum alloy single crystals. The aluminum alloy heat treatments included annealing, solution, and precipitation. Solution was found to increase erosion resistance but precipitation had the opposite effect. Hardness showed no correlation with erosion resistance for either aluminum alloy steel. The steel tests showed that crushed glass provides an order of magnitude more erosion than glass beads. C.D.

A82-27075 * # **Rub energetics of compressor blade tip seals.** W. F. Laverty (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). In: Wear of materials 1981; Proceedings of the International Conference, San Francisco, CA, March 30-April 1, 1981. New York, American Society of Mechanical Engineers, 1981, p. 714-721. 8 refs. NASA-sponsored research.

The rub mechanics of aircraft gas turbine engine compressor abradable blade tip seals was studied at simulated engine conditions. In 12 statistically planned, instrumented rub tests using single titanium blades and fiber-metal rubstrips the rub velocity, incursion rate, incursion depth, blade thickness, and abradable strength were varied to determine the effects on rub energy, heat split between the blade, rubstrip surface and rub debris, and blade and seal wear. The rub energies were found to be most significantly affected by the incursion rate while rub velocity and blade thickness were of secondary importance. In five additional rub tests using single nickel alloy blades and multiple titanium alloy blades, rub energy and wear effects were found to be similar for titanium and nickel alloy blades while rub energies increased for multiple blades relative to single blade test results. C.D.

A82-27082 # **Communicating critical weather information to pilots.** R. C. Goff (FAA, Technical Center, Atlantic City, NJ). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0016.* 12 p.

is incorporated in a computer algorithm for real-time failure state detection in aircraft engine output sensors, along with a set of hypothesis-conditioned Kalman filters for failed sensor output estimation and associated error covariance matrix determination. Real-time processing incorporating current sensor readings is employed by the algorithm. A decision logic which overcomes analytical difficulties due to inherent aircraft engine nonlinearities is proposed, and an application of the method to a realistic turbojet engine model undergoing simulated output sensor failures furnishes a numerical example. O.C.

A82-28475 † **The use of dynamometer readings for damping of the natural vibrations of twin-rotor gyrocompasses (Pro vikoristannia pokazan' N'iutonometriv dlia dempfiruvannia vlasnikh kohivan' dvorotornikh girokompasiv).** V. M. Kalinovich (Akademiia Nauk Ukrainskoi SSR, Institut Matematiki, Kiev, Ukrainian SSR). *Akademiia Nauk Ukrains'koi SSR, Dopovidi, Seriia A - Fiziko-Matematichni ta Tekhnichni Nauki,* Jan. 1982, p. 43-46. 5 refs. In Ukrainian.

It is demonstrated that a circuit is feasible in which the damping of the natural vibrations of a twin-rotor gyrocompass is realized on the basis of dynamometer measurements. Two versions of the proposed circuit using one or two dynamometers and information on the divergence angle of the gyroscopes are discussed. V.L.

A82-28476 **Improving the crashworthiness of general aviation aircraft by crash injury investigations.** W. R. Kirkham (FAA, Civil Aeromedical Institute, Oklahoma City, OK). *Aviation, Space, and Environmental Medicine,* vol. 53, Apr. 1982, p. 319-325.

An aircraft accident investigation program correlates injuries to occupants with the severity of impacts and structural changes in the crash. Findings brought to the attention of aircraft manufacturers have led to specific aircraft being made more crashworthy. The finding of a failure in a shoulder harness attachment led to the strengthening of the attachment brace. The way a shoulder harness was joined to a lapbelt was modified following a noted failure. The finding of fractures of lapbelt and shoulder harness cable tiedowns led to the use of stronger cables and modification of the installation. Other findings resulted in a shoulder strap guide being placed on an inertia reel and a sidemounted seat being modified. Described also are three seat-related features which, although meeting FAA standards, during the dynamics of a crash may lack desirable energy attenuation. These findings illustrate the value of aircraft crash injury correlations. (Author)

A82-28513 # **Active flutter suppression on an F-4F aircraft.** O. Sensburg, H. Hönlinger (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany), T. E. Noll, and L. J. Huttsell (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *(AIAA, ASME, ASCE, and AHS, Structures, Structural Dynamics and Materials Conference, 21st, Seattle, WA, May 12-14, 1980, AIAA Paper 80-0770.) Journal of Aircraft,* vol. 19, May 1982, p. 354-359. 18 refs.

Extensive research programs have been conducted at Messerschmitt-Bölkow-Blohm (MBB) to investigate the application of active flutter and mode control to achieve increased flutter margins. Such techniques are of special interest for airplanes that already have a full command and stability augmentation system together with fast responding control surface actuators and that carry heavy wing mounted stores. A flutter suppression system (FSS) was installed on the F-4F, and this system was flight tested. The control law was found by applying optimal control theory, thus minimizing the control surface motion due to disturbances and providing the required stability margins. During the test it was found that the dynamic properties of the wing-pylon-store system change considerably with vibration amplitude because of play and preload. (Author)

A82-28514 # **Experimental study of oscillating-wing propulsion.** J. D. DeLaurier (Toronto, University, Toronto, Canada) and J. M. Harris (Battelle Memorial Institute, Columbus, OH). *Journal of Aircraft,* vol. 19, May 1982, p. 368-373. 10 refs. Research supported by the University of Toronto.

In this experimental study of flapping-wing thrust, a wing of 8 in. span and 2 in. chord was oscillated in a low-speed wind tunnel. The driving apparatus produced nearly sinusoidal heaving with superimposed pitching of variable amplitude and phase angle. The flapping frequency range of 0-8 Hz produced reduced frequencies for which flow separation was unlikely to occur, based on the measured static characteristics of the test airfoil (NACA 0012) over the Reynolds number range of interest (25,000-40,000). The average thrusting effort of the wing was measured and plotted in coefficient form against reduced frequency, with pitching amplitude and phase angle as parameters. Comparisons of the results with theoretical predictions and previous experimental work were made. In general, the results show approximately linear dependence of thrust on reduced frequency and best performance at phase angles of 90-120 deg of pitching lagging heaving. Although thrusting effort was produced for all pitching amplitudes, including zero, the highest readings were obtained for the maximum pitching amplitude of 12.1 deg. (Author)

A82-28515 # **Advanced engine technology and its influence on aircraft performance.** U. Olsson (Volvo Flugmotor AB, Trollhattan, Sweden). *Journal of Aircraft,* vol. 19, May 1982, p. 380-384. Research supported by the Swedish Air Material Board.

In order to identify problem areas and to investigate the importance of advanced engine technologies, design studies were made on a hypothetical engine for the mid-1980s. The resulting engine has a turbine inlet temperature of 1800 K, overall pressure ratio of 22.9, and thrust-to-weight ratio of 11.5. Technologies involved include boron-aluminum fan blades, a two-stage flash-vaporizing combustor, tungsten-reinforced turbine blades, and full authority electronic control. In fighter mission simulation studies the engine has been shown to result in aircraft superior to those existing today. (Author)

A82-28518 # **Effect of downwash on the induced drag of canard-wing combinations.** G. F. Butler (Royal Aircraft Establishment, Farnborough, Hants., England). *Journal of Aircraft,* vol. 19, May 1982, p. 410, 411. 7 refs.

The induced drag of canard-wing and wing-tail combinations is calculated for the limiting case in which the downstream surface is located in the Trefftz plane (infinite stagger), but based on the assumption that the loading on each surface is elliptical in isolation. It is shown that additional terms associated with induced circulation effects act to reduce the drag over that calculated using the classical theory. This induced thrust component is shown to be very small for the wing-tail configuration, but significant for the canard-wing layout. In addition, given elliptic loading on the upstream surface, an expression is derived for the loading distribution on the downstream surface which is optimum in the sense that the induced thrust component is maximized. G.R.

A82-28519 # **Aircraft pitch attitude as a performance parameter.** M. E. Eshelby (Cranfield Institute of Technology, Cranfield, Beds., England). *Journal of Aircraft,* vol. 19, May 1982, p. 412-414.

It is pointed out that in transport operations the pitch attitude of the cabin may have an effect on the safety and the comfort of the passengers and the crew. If the angle of the cabin floor to the horizontal is steep, it will present a hazard to passengers and cabin staff moving about the aircraft. It is preferable to maintain as much as possible a near-level cabin pitch attitude throughout the flight. Once the enroute climb is initiated it should be possible to restrict the aircraft body axis system to very small limits. This can be achieved by using the changes in zero-lift incidence with flap setting, and associated changes in zero lift drag, to determine the relationship between aircraft body attitude and wing incidence and equating the difference to flight path gradient. An analysis of attitude-directed performance is conducted. G.R.

A82-28534 **Automated ultrasonic inspection of adhesive bonded structure.** D. J. Hagemaier (Douglas Aircraft Co., Long Beach, CA). *Materials Evaluation,* vol. 40, Apr. 1982, p. 572-578. 14 refs.

The development of an automated ultrasonic bond inspection device for inspecting adhesively bonded metal-to-metal panels containing voids and porosity is described. Defects are noted to be present in the interface between the adhesive and the sheet metal, in the cured adhesive material, and other types caused during fabrication. A multiprobe adhesive bond inspection technique employing an ultrasonic resonance impedance method was chosen for operation in the immersion mode. The samples were C-scanned at 5 MHz, then again with a modified tester at 300 kHz at varying water paths from 0.025-2.54 mm. Finally, a 166 kHz scan was proven capable of detecting porosity, voids, and unbonds. The results indicate acceptable performance for applications in automated high production rate bonded fuselage inspections. M.S.K.

N82-21153# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
ACTA AERONAUTICA ET ASTRONAUTICA SINICA
29 Dec. 1981 224 p Transl. into ENGLISH of Acta Aeron. et Astron. Sinica (China), v. 2, no. 2, 1981 p 1-102
(AD-A110282; FTD-ID(RS)T-1129-81) Avail: NTIS HC A02/MF A01 CSCL 01/3

A collection of articles in aeronautical engineering is presented. Some of the topics discussed are: (1) oscillatory subsonic potential flows around three dimensional bodies and its application in calculating dynamic stability derivatives; (2) interpolation mixed differential method for transonic large distributed symmetrical potential flow around airfoil; (3) calculation of lift and drag characteristics of subsonic wings with winglets; (4) model for predicting overload retardation effect in fatigue crack propagation; (5) J-integral experimental calibration of sheet specimens with single edge notch; (6) design of transonic turbine cascade by hodograph method; (7) three dimensional stress analysis for a shrouded air cooled turbine blade; (8) methods for measuring radar ECCM performance; (9) aiming computation for fighter weapon aiming system; (10) optimum design of nonmoment laminated composite plate. E.A.K.

N82-21154# Societe Nationale Industrielle Aerospatiale, Paris (France). Helicopter Div.
INDUSTRIAL EXPERIENCE IN THE ANGLO-FRENCH HELICOPTER COLLABORATION
J. C. Sieffer 1980 8 p
(SNIAS-811-210-101) Avail: NTIS HC A02/MF A01

Anglo-French helicopter collaboration are summarized. The development of the SA 330 Puma, the SA 341 Gazelle, and the WG 13 Lynx multipurpose helicopter, with three versions for a variety of uses, is covered, and the launching of derivative aircraft (Westland WG 30 and Aerospatiale Super-Puma) is mentioned. The organization and experience of the collaboration are described, with the French and British shares of the work on each helicopter quantified. Sales are reviewed and compared with forecasts. Author (ESA)

N82-21155# Royal Aircraft Establishment, Farnborough (England).
A SUMMARY OF EXPERIMENTAL DATA ON WING CHARACTERISTICS AT TRANSONIC SPEEDS
T. Nonweiler Apr. 1948 42 p refs
(RAE-TN-Aero-1953-S.D.-77) Avail: NTIS HC A03

Dropped and rocket propelled models are tested. American tests give a variation in form drag with thickness at the speed of sound in accordance with the two thirds power law. British tests indicate a constant dray coefficient on frontal area. There is a tendency to reduce drag by introducing taper or reducing aspect ratio on rectangular wings. Results on swept wings are inconsistent but the reduction in drag with sweepback is very pronounced. Tunnel bulge tests indicate that the drag due to lift becomes very large at Mach numbers just below 1. Author (ESA)

N82-21156*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.
HELICOPTER ROTOR LOADS USING A MATCHED ASYMPTOTIC EXPANSION TECHNIQUE Final Report
G. Alvin Pierce and Anand R. Vaidyanathan May 1981 125 p refs
(Contract NAS1-16222)
(NASA-CR-165742; NAS 1.26:165742) Avail: NTIS HC A06/MF A01 CSCL 01A

The theoretical basis and computational feasibility of the Van Holten method, and its performance and range of validity by comparison with experiment and other approximate methods was examined. It is found that within the restrictions of incompressible, potential flow and the assumption of small disturbances, the method does lead to a valid description of the flow. However, the method begins to break down under conditions favoring nonlinear effects such as wake distortion and blade/rotor interaction. E.A.K.

N82-21157*# Sikorsky Aircraft, Stratford, Conn.
AEROELASTIC ANALYSIS OF THE ELASTIC GIMBAL ROTOR Report, May 1980 - May 1981
Raymond G. Carlson and Wen-Liu Miao May 1981 102 p refs Prepared for Army Research and Technology Labs.
(Contract DAAK51-80-C-0016)
(NASA-CR-166287; NAS 1.26:166287; USAAVRADCOM-TR-82-A-3; SER-510046) Avail: NTIS HC A06/MF A01 CSCL 01A

An aeroelastic and structural loads analysis of the elastic gimbal rotor (EGR) was conducted. The structural loads analysis of the elastic gimbal rotor indicated that the gimbal spring element is the critical component in the rotor system design, but that practical designs for all components should be achievable. The aeroelastic analysis was conducted using a version of the G400 Rotor Aeroelastic Analysis especially modified to evaluate the EGR. Hover stability showed that a stiff inplane blade was more stable than a soft inplane blade. Stability was sensitive to control system coupling (pitch gimbal coupling), gimbal spring stiffness, and blade frequency placement. Ground resonance analysis showed both soft and stiff inplane rotors to be stable. A limited evaluation of the EGR in forward flight was conducted. Due to G400 analysis limitations, the results were not sufficient to define forward flight stability and stress limits. B.W.

N82-21158*# Vought Corp., Dallas, Tex.
V/STOL TANDEM FAN TRANSITION SECTION MODEL TEST
William E. Simpkin Mar. 1982 156 p refs
(Contract NAS3-22155)
(NASA-CR-165587; NAS 1.26:165587; TR2-53200/2R-53085) Avail: NTIS HC A08/MF A01 CSCL 01A

An approximately 0.25 scale model of the transition section of a tandem fan variable cycle engine nacelle was tested in the NASA Lewis Research Center 10-by-10 foot wind tunnel. Two 12-inch, tip-turbine driven fans were used to simulate a tandem fan engine. Three testing modes simulated a V/STOL tandem fan airplane. Parallel mode has two separate propulsion streams for maximum low speed performance. A front inlet, fan, and downward vectorable nozzle forms one stream. An auxilliary top inlet provides air to the aft fan - supplying the core engine and aft vectorable nozzle. Front nozzle and top inlet closure, and removal of a blocker door separating the two streams configures the tandem fan for series mode operations as a typical aircraft propulsion system. Transition mode operation is formed by intermediate settings of the front nozzle, blocker door, and top inlet. Emphasis was on the total pressure recovery and flow distortion at the aft fan face. A range of fan flow rates were tested at tunnel airspeeds from 0 to 240 knots, and angles-of-attack from -10 to 40 deg for all three modes. In addition to the model variables for the three modes, model variants of the top inlet were tested in the parallel mode only. These lip variables were: aft lip boundary layer bleed holes, and Three position turning vane. Also a bellmouth extension of the top inlet side lips was tested in parallel mode. B.W.

N82-21159*# Flow Simulations, Inc., Sunnyville, Calif.
COMPUTATION OF WING-VORTEX INTERACTION IN TRANSONIC FLOW USING IMPLICIT FINITE DIFFERENCE ALGORITHM Final Report
G. Srinivasan and J. L. Steger Mar. 1981 63 p refs
(Contract NAS2-10474)
(NASA-CR-166251; NAS 1.26:166251) Avail: NTIS HC A04/MF A01 CSCL 01A

An implicit delta form finite difference algorithm for Euler equations in conservation law form was used in preliminary calculations of three dimensional wing vortex interaction. Both steady and unsteady transonic flow wing vortex interactions are computed. The computations themselves are meant to guide upcoming wind tunnel experiments of the same flow field. Various modifications to the numerical method that are intended to improve computational efficiency are also described and tested in both two and three dimensions. Combination of these methods can reduce the overall computational time by a factor of 4. S.L.

N82-21161# Royal Aircraft Establishment, Farnborough (England).
LOW-SPEED MEASUREMENTS OF THE STATIC PRESSURE DISTRIBUTION AND OVERALL FORCES ON A CAMBERED AND A SYMMETRIC MILD GOTHIC WING OF ASPECT RATIO 1.4
P. J. Butterworth and D. G. Dobney London HMSO 22 May 1980 85 p refs
(RAE-TR-80066; RAE-AERO-3482; BR75504) Avail: NTIS HC A05/MF A01

A cambered wing of aspect ratio 1.4 was tested in a low speed wind tunnel to determine its surface static pressure distribution at its designed attached flow incidence for comparison with the theoretical loading. To isolate the effects of camber on the separated flow characteristics of this planform, the corresponding symmetric wing was also included in the test program. The lift, drag and pitching moment characteristics of each wing were measured over a range of Reynolds numbers for comparison with the results of the earlier force tests and those derived by integration of the measured pressure distributions. It is found that at twice the design lift coefficient, the lift-dependent drag of the cambered wing is about 20% lower than that of the symmetric wing due to the favorable shift of the minimum point of the drag caused by the addition of camber. At higher values of the lift coefficient this reduction in lift-dependent drag is less, due to the unfavorably changed shape of the cambered wing's drag polar. Also, flow visualization tests and the form of the measured pressure distribution near the leading edges of the cambered wing at its design incidence confirm that the flow is attached along the leading edges. Author (ESA)

N82-21162# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Flugzeuge.

AERODYNAMICS PROJECT. SIGNIFICANCE AND DIFFICULTIES IN THE EXPERIMENTAL AND NUMERICAL SIMULATION OF COMPLEX FLOW PROCESSES WITH HIGH REYNOLDS NUMBER AS PART OF AIRCRAFT PROJECTS [PROJEKTAERODYNAMIK. BEDEUTUNG UND PROBLEMATIK VON EXPERIMENTELLEN UND NUMERISCHEN SIMULATIONEN KOMPLEXER STROEMUNGSVORGAENGE MIT GROSSER REYNOLDS-ZAHL FUER DIE PROJEKTENTWICKLUNG VON FLUGZEUGEN]

W. Heinzerling 29 May 1980 29 p refs In GERMAN
(MBB-FE-120/S/PUB/33; DGLR-80-028) Avail: NTIS HC A03/MF A01

The importance of aerodynamic simulation in design processes is considered. Simulation as an aid in aircraft development is discussed, revealing fundamental problems posed by the modeling of flow regimes on aircraft configurations. The geometry and complexity of flow mechanics for specific configurations are elaborated. The observance of Reynolds similarity conditions is discussed. Possibilities and limitations of complex aerodynamic simulation are assessed. Numerical, experimental, and high Reynolds number simulation are then evaluated. Results are used in reviewing plans for a European transonic cryogenic wind tunnel. Given an optimal layout, the impact of this facility on the performance and competitiveness of the European aircraft industry is forecast. Author (ESA)

N82-21163# Royal Aircraft Establishment, Farnborough (England).

PRESSURE MEASUREMENTS ON A WING OSCILLATING IN SUPERCRITICAL FLOW

N. C. Lambourne and B. L. Welsh London HMSO 25 Jun. 1979 178 p refs
(RAE-TR-79074; RAE-Struct-BF/B/0783; BR71046) Avail: NTIS HC A09/MF A01

Perturbation pressures were measured on a model wing oscillating in a wind tunnel to study wing flutter under transonic conditions. The half model, which is based on a high aspect ratio wing of modern design could be given a small-amplitude oscillation consisting of rigid body rotation about a swept axis. The unsteady in-phase and in-quadrature pressure distributions were measured at five chordwise stations. Free stream Mach number was varied in stages from 0.80 to 0.86. The measurements were restricted to one value of oscillation frequency which corresponded to frequency parameters, based on mean chord, in the range 0.39 to 0.54. The oscillatory pressure distributions together with the principal oscillatory wing forces and moments obtained by integration are considered in relation to the steady flow pattern over the wing and particularly in relation to the development of transonic mixed flow at the upper surface. The effects arising from the presence of a shock wave are identified and discussed. Some comparisons are made between the measurements and the results of subsonic thin wing theory. Author (ESA)

N82-21164# Royal Aircraft Establishment, Farnborough (England).

PRESSURE DISTRIBUTIONS ON SOME DELTA WINGS AT M = 4

L. C. Squire (Cambridge Univ., Engl.) and K. C. Moore London HMSO 22 May 1980 46 p refs
(RAE-TR-80068; RAE-Aero-3484; BR76040) Avail: NTIS HC A03/MF A01

Complete pressure distributions are presented for a series of delta wings tested through an incidence range at a Mach number of 4. Aspect ratios of models 1 and 3 were 4/3 and 1 respectively, and models 3 to 7, 2/3. The results were integrated to obtain lift and drag coefficients and the values found are in good agreement with the trend from measurements on similar wings at lower Mach numbers. Some of the models were designed to test a possible method of engine/airframe integration. The results show that it is possible to add volume to the rear of the wing without increasing the drag of the forebody, thus confirming the proposed method of integration. Author (ESA)

N82-21166*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

FULL-SCALE FLAMMABILITY TEST DATA FOR VALIDATION OF AIRCRAFT FIRE MATHEMATICAL MODELS

Jerome F. Kuminecz and Richard W. Bricker Feb. 1982 874 p refs
(NASA-TM-58244; NAS 1.15:58244) Avail: NTIS HC A99/MF A01 CSCL 01C

Twenty-five large scale aircraft flammability tests were conducted in a Boeing 737 fuselage at the NASA Johnson Space Center (JSC). The objective of this test program was to provide a data base on the propagation of large scale aircraft fires to support the validation of aircraft fire mathematical models. Variables in the test program included cabin volume, amount of fuel, fuel pan area, fire location, airflow rate, and cabin materials. A number of tests were conducted with jet A-1 fuel only, while others were conducted with various Boeing 747 type cabin materials. These included urethane foam seats, passenger service units, stowage bins, and wall and ceiling panels. Two tests were also included using special urethane foam and polyimide foam seats. Tests were conducted with each cabin material individually, with various combinations of these materials, and finally, with all materials in the cabin. The data include information obtained from approximately 160 locations inside the fuselage. Author

N82-21167# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio. Biomechanical Protection Branch.

EVALUATION OF A PROPOSED MODIFIED F/FB-111 CREW SEAT AND RESTRAINT SYSTEM

James W. Brinkley, James H. Raddin, Jr., Bernard F. Hearon, Lawrence A. McGowan, and Joseph M. Powers Nov. 1981 418 p refs
(AF Proj. 7231)
(AD-A110188; AFAMRL-TR-80-52) Avail: NTIS HC A18/MF A01 CSCL 01/3

A total of 187 human impact tests were performed in the cardinal axes, including vertical (up to 10G, 8.1 m/sec), sideward (up to 8G, 9.2 m/sec), and forward facing (up to 10G, 9.8 m/sec). Subjects were exposed to similar impacts using different seat position adjustments to allow parametric analysis. Measured data included seat acceleration and velocity, head and chest translational acceleration components, triaxial forces acting on the seat pan and footrest, forces acting at the restraint harness attachments, and displacements of various body segments. In vertical impact tests, the forward position of the headrest appeared to cause increased forward acceleration of the head. Vertical impact tests demonstrated increased head accelerations with higher shoulder harness angles. Analysis of restraint loads in sideward impacts showed that more of the lateral support is provided by the lap belt with higher shoulder harness angles. This indicates potentially degraded lateral support of the upper torso with the proposed modification. GRA

N82-21171# Mitre Corp., McLean, Va. Metrek Div.

PRELIMINARY FUNCTIONAL DESCRIPTION OF INTEGRATED FLOW MANAGEMENT

D. L. Adams, Stephen M. Alvania (FAA), Roger Brubaker (FAA), Kerry M. Levin, Richard J. Marek (FAA), M. F. Medeiros (Transportation Systems Center), G. R. Rowland (FAA), and A. N. Sinha Oct. 1981 248 p refs
(Contract DTFA01-81-C-10001)
(AD-A109909; MTR-81W252; FAA-EM-82-7) Avail: NTIS HC A11/MF A01 CSCL 05/1

A preliminary functional description of Integrated Flow Management (IFM) is documented in this report. The objective is to provide a strawman concept so that further IFM development

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering – A Continuing Bibliography* (NASA SP-7037) lists 362 reports, journal articles, and other documents originally announced in July 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes – subject, personal author, and contract number – are included.

An annual cumulative index will be published.

optimum of operational safety, and design and constructional details. The various types of operations for which the BK117 has been employed are discussed, giving attention to specific data regarding the weight relations in each case. G.R.

A82-29592 F-15 fighter abilities evaluated. R. R. Ropelewski. *Aviation Week and Space Technology,* vol. 116, Apr. 26, 1982, p. 39-43, 45, 46.

Modifications, features, and operations of the F-15 in an all weather air-to-ground capability configuration are described. The rear cockpit has been outfitted with four multifunction CRT displays, the mission computer memory has been expanded by 50%, updates in the inertial navigation are now high velocity, and integration of the FLIR and laser ranging system has been accomplished. The total program took a year and a half, and successful demonstration ground strikes are detailed. Specific attention is given to lock-on and forget radar systems and digital menus for calling up enlargements of displayed scenes on the CRT. Images lost during maneuvers could be restored by recycling the computer. The controlled maneuverability of the aircraft is stressed, as are necessities for calibrating the radar systems, proving the sensors, and testing a variety of munitions. M.S.K.

A82-29596 * Test methodology for evaluation of fireworthy aircraft seat cushions. D. A. Kourtides and J. A. Parker (NASA, Ames Research Center, Chemical Research Projects Office, Moffett Field, CA). *Journal of Fire and Flammability,* vol. 13, Jan. 1982, p. 56-76. 8 refs. FAA-sponsored research.

Aircraft seat materials were evaluated in terms of their thermal performance. The materials were evaluated using (a) thermogravimetric analysis, (b) differential scanning calorimetry, (c) a modified NBS smoke chamber to determine the rate of mass loss and (d) the NASA T-3 apparatus to determine the thermal efficiency. In this paper, the modified NBS smoke chamber will be described in detail since it provided the most conclusive results. The NBS smoke chamber was modified to measure the weight loss of materials when exposed to a radiant heat source over the range of 2.5 to 7.5 W/cm sq. This chamber has been utilized to evaluate the thermal performance of various heat blocking layers utilized to protect the polyurethane cushioning foam used in aircraft seats. Various kinds of heat blocking layers were evaluated by monitoring the weight loss of miniature seat cushions when exposed to the radiant heat. The effectiveness of aluminized heat blocking systems was demonstrated when compared to conventional heat blocking layers such as neoprene. All heat blocking systems showed good fire protection capabilities when compared to the state-of-the-art, i.e., wool-nylon over polyurethane foam. (Author)

A82-29597 An evaluation study of aluminide and chromoaluminide coatings on IN-100. R. Sivakumar (Defence Metallurgical Research Laboratory, Hyderabad, India). *Oxidation of Metals,* vol. 17, Feb. 1982, p. 27-41. 21 refs.

Aluminide and chromoaluminide diffusion coatings on IN-100, a cast Ni-base superalloy, have been investigated under laboratory conditions with reference to their structure and protective properties. The observed differences in the cyclic oxidation and hot corrosion behavior of the coatings are rationalized in terms of the coating chemistry, and in particular, Cr and Al contents in the outer layers. The results obtained provide a way to predict the performance of NiAl-base coatings on Ni-base alloys. V.L.

A82-29659 # Crossflow shock on the suction side of a flat delta wing with supersonic leading edges. S. Kubo and T. Fujimoto (Kyoto University, Kyoto, Japan). *(Asian Congress of Fluid Mechanics, Ist, Bangalore, India, Dec. 8-13, 1980). Japan Society for Aeronautical and Space Sciences, Transactions,* vol. 24, Feb. 1982, p. 211-221. 11 refs.

A theoretical investigation is made on the crossflow shock on the suction side of a flat delta wing with supersonic leading edges in a uniform supersonic flow. An extension of the analytic characteristic method is carried out for a three dimensional inviscid flow past a wing. Special care is taken in the treatment of the boundary conditions at the leading edge, at which there is a centered simple expansion wave. A crossflow shock is analyzed on the wing surface. It is found that a weak crossflow shock appears under every condition of the angle of attack and sweepback angle of the leading edge. The location and the strength of the shock are compared with those of available experimental and numerical results. They are compatible with each other within the accuracy of the present analysis. (Author)

A82-29714 Sea-based remotely piloted vehicles. I - Issues and concepts. C. Henderson (Institute for Defense Analyses, Alexandria, VA). *Military Electronics/Countermeasures,* vol. 8, Apr. 1982, p. 61-64.

Remotely piloted vehicles (RPVs) in the 10,000-15,000 lb class, equipped with radar and designed to operate from a variety of naval vessels, are proposed as long-range early warning platforms for carrier battle groups. Consideration is given to the inherent potential of RPVs for such missions as command, control and communications (C3), surface surveillance, anti-air warfare, antisubmarine warfare and electronic warfare. It is noted that the RPV payload weight plays an important role in determining the propulsion system thrust required, takeoff and landing modes, and the fuel volume needed for a mission of given duration. While C3 RPVs would be equipped with communication gear and early warning RPVs with powerful search radars, all RPVs would carry data link hardware for command and control and sensor data transmissions. Attention is given to the use of conformal radar arrays, which are shaped to the contour of the aircraft skin. O.C.

A82-29773 Computational aerodynamics - Its coming of age and its future. L. R. Miranda (Lockheed-California Co., Burbank, CA). *Lockheed Horizons,* Spring 1982, p. 14-24.

Current capabilities of computational aerodynamics are examined and an attempt is made to assess its future role in aircraft design. Computational aerodynamics is the numerical solution of equations of motion of fluids using digital computers and subsequent simulation of the corresponding aerodynamic flowfields. Simulations are noted to be significant for performance, design, and safety of aircraft. Fields of numerical analysis, aerodynamic theory, and computer technology are combined to produce the numerical simulation, with the projected flowfields being generated by solutions to the Navier-Stokes equations in the form of increasingly closer approximations. Panel methods, a simplified form of the full solution, are explored, and their ability to remain computationally efficient with complex geometries is stressed. Advances in computer technology are foreseen to enhance the option of using full Navier-Stokes equations for high-speed aerodynamic simulations. M.S.K.

A82-29774 Fuel efficient and Mach 0.8, too. W. E. Arndt (Lockheed-Georgia Co., Marietta, GA). *Lockheed Horizons,* Spring 1982, p. 26-34.

Principles of propfan technology and problems which must be solved for the introduction of propfans to production aircraft are discussed. The Hamilton-Standard concept, introduced in 1975, includes thin profile, swept-back multiple blades (8-10) suitable for cruise speeds of Mach 0.8 with 15-20% less fuel consumption than currently available with turbofans. Studies in loading fatigue are necessary to determine if the cyclic loading caused by high-speed swept back wings will adversely affect the integrity of composite-material propfans. Additional areas of concern are effects on the aerodynamic efficiency of aircraft induced by the presence of multibladed propfans, and the necessity of adding noise-reducing materials to maintain satisfactory cabin noise levels is a potential weight penalty factor. NASA trials on a converted Jetstar are described, along with possible techniques to reduce near- and farfield noise levels. M.S.K.

A82-29789 Aerodynamics at the 1981 Le Bourget show (L'aérodynamique au Salon du Bourget 1981). L. Rosenthal (Centre de Documentation de l'Armement, Paris, France). *L'Aéronautique et l'Astronautique,* no. 92, 1982, p. 37-56. 20 refs. In French.

Applications of the current state of the art in aircraft aerodynamics and general tendencies in the development of the field as manifested at the 23rd International Air and Space Show at Le Bourget in 1981 are considered. Among the new aircraft presented at the show, the most original include the Transavia T 300 Sky Farmer, the Edgley EA7 Optica three-seat observation plane and the NASA Bell XV-15 experimental STOL craft. Configurations receiving significant attention at the show were those with winglets, canards and strakes, especially on military aircraft, leading edge flaps, the remotely piloted HiMAT aircraft and aircraft with forward-swept wings. Developments in propulsion aerodynamics involved air intakes, streamlined and multi-bladed propellers and the prop-fan. The importance of developments in composite materials, propulsion and systems to the realization of these aerodynamic configurations is emphasized. A.L.W.

A82-29792 **Laser gyros - The guiding light.** J. Hecht. *High Technology*, vol. 2, May-June 1982, p. 24, 26-28.

The key advantages of laser gyros over mechanical gyroscopes are the absence of moving parts and lower cost. The laser gyro is a rotation sensor consisting of a rotating ring in which intense monochromatic light going in both directions is generated by the excitation of an active medium in an optical resonator defined by three or more mirrors. Rotating the ring laser changes the effective resonator length so that the frequency of one beam is upshifted and the other downshifted. Turning a typical ring laser by 10 degrees per hour will cause a detectable frequency shift of a few hertz. A number of approaches have been taken to solve the systems's main problem, the tendency of the beams to lock together at the same frequency when the rotation rate is very small. Optical fiber gyros may find use in systems where cost and compactness rather than accuracy are the chief consideration. C.D.

A82-29793 **Future auto engines - Competition heats up.** C. Rain. *High Technology*, vol. 2, May-June 1982, p. 39-47.

The conventional internal combustion engine will remain an important factor in future automobile engines because it is perfectly suited to the widely varying conditions of city and highway driving, and engineers continue to eke out design advances. Diesels will continue to make strong gains in the near term because of their fuel economy advantage, but their emissions and fuel requirement problems are serious. Stratified charge engines could challenge the diesel because they satisfy governmental goals and would require the lowest retooling costs. Their multifuel capability gives them long-term viability. The gas turbine and the Stirling offer the best fuel economies and are clean-burning, and both run on a wide range of fuels. The Stirling requires engineering to improve its power density and to cut costs, while the gas turbine needs a breakthrough in durable high-temperature ceramics. C.D.

A82-29800 **Handling air freight in the 1980s - Meeting the challenge.** P. L. Peoples and V. Sweetland (Boeing Commercial Airplane Co., Renton, WA). *Aircraft Engineering*, vol. 54, Mar. 1982, p. 7-10.

Flight hardware and ground system development areas which are necessary to meet the expected growth in air cargo in the 1980 decade are reviewed. Boeing has undertaken studies involving full-scale mock-ups of the 767 and 757 and various cargo loads to attempt optimization of cargo pallets, container shapes, and handling procedures in moving freight. The large cargo-handling capacity of the 747 is outlined, noting the commonality designed into the cargo configurations for the 767 and 747. Freight and baggage handling procedures have been observed to have divergent requirements, although the LD-4 pallet offers an opportunity for the most efficient loading of either. Cargo and baggage packaging within standardized modules for loading on pallets is asserted to offer 95-97% space utilization. M.S.K.

A82-29820 † **The stressed state of a parachute canopy during opening (Napriazhennoe sostoianie kupola parashiuta pri raskrytii).** G. N. Gaiubov (Tashkentskii Politekhnicheskii Institut, Tashkent, Uzbek SSR). *Akademiia Nauk Uzbekskoi SSR, Doklady*, no. 1, 1982, p. 12-14. 5 refs. In Russian.

A82-29826 † **Optimization of measurements in the state estimation of systems using the least squares method (Optimizatsiia sostava ispol'zuemykh izmerenii v zadachakh otsenivaniia sostoianiia sistem metodom naimen'shikh kvadratov).** L. G. Ambartsumov. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 3-6. 5 refs. In Russian.

Problems of the state estimation of aircraft systems are characterized by a large quantity of information to be processed. This results in an increase in the cost of computations, a decrease in the reliability of the results, and an increase in data processing time. For this reason it is necessary to limit the number of measurements. This paper gives a mathematical formulation and examines the characteristics of the optimization of the number and character of measurements made in the problem of state estimation using the least squares method in the case of an arbitrary matrix of measurements. B.J.

A82-29827 † **The stability of maneuverable flight vehicles (K ustoichivosti manevrennykh letatel'nykh apparatov).** A. B. Aminov. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 7-11. 5 refs. In Russian.

A method is developed for obtaining the region of asymptotic stability in the coefficient space of the nonlinear differential equations of the perturbed motion of a maneuverable flight vehicle. As an example, an analysis is presented of the stability of the longitudinal motion of a flight vehicle with large attack-angle deviations. B.J.

A82-29828 † **Comparison of light aircraft with strutted and cantilever wings (Sravnenie legkikh samoletov s podkosnym i svobodnonesushchim krylom).** A. A. Badiagin. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 11-17. 5 refs. In Russian.

A general formula for the analysis of the mass of strutted and cantilever wings of light aircraft is proposed. Optimal aspect ratio is analyzed, and a formula for determining the maximum flight velocity of a strutted-wing aircraft is presented. The strutted wing is found to be somewhat more cost effective than the cantilever wing. B.J.

A82-29829 † **Design principles of a computer-aided design system (Printsipy postroeniia sistemy mashinnogo konstruirovaniia).** Iu. V. Davydov, A. A. Zazhigin, and V. A. Osipov. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 17-22. 11 refs. In Russian.

The structure and basic features of a computer system for the design of flight vehicles are described. Particular attention is given to mathematical models for the description of wing contours, the determination of external loads, strength analyses, the determination of the geometric characteristics of the components, the graphics system, and the formation of control programs. The input and output parameters of each module of the system are discussed. B.J.

A82-29831 † **Investigation of the aerodynamic-contour method with control functions in the form of smooth constant-sign contours (Issledovanie metoda aerodinamicheskogo kontura s upravliaiushchimi funktsiiami v vide gladkikh obvodov postoiannogo znaka).** R. Kh. Akhatov and V. A. Osipov. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 27-31. In Russian.

A modified aerodynamic-contour method is developed which is based on the use of a control function in the form of smooth contours of constant sign. This makes it possible to obtain a mathematical model for a profile curve with normalized constancy of sign and a wide range of variation of the input information. The method is convenient for controlling profile shape and produces a considerable savings in machine time. B.J.

A82-29832 † **Estimation of the performance of nonstationary discontinuous control systems for flight vehicles (Otsenka effektivnosti nestatsionarnykh razryvnykh sistem upravleniia letatel'nykh apparatov).** E. A. Kuklev. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 37-41. In Russian.

The paper examines a linear dynamic system with discontinuous controls conditioned by changes in the operational modes of the system at random moments of time. An analytical method is proposed for determining the averaged values of the performance functionals of the system, with allowance for a finite number of discontinuities. B.J.

A82-29834 † **Analysis of a multihinged empennage with allowance for shear strain (Raschet mnogosharnirnogo opereniia s uchetom deformatsii sdviga).** V. A. Pavlov and V. A. Portnoi. *Aviatsionnaia Tekhnika*, no. 4, 1981, p. 46-51. In Russian.

A method for analyzing a multihinged empennage is presented, wherein the shear displacements included in the resolvent compatibility equations are determined by the Timoshenko method. Analysis results are presented on the empennage of an actual aircraft, and the necessity of taking into account shear strain of the control surface and stabilizer in their own plane is found to be confirmed. B.J.

Jan. 1982 9 p refs

Avail: NTIS HC A08/MF A01

An engine part retirement for cause (RFC) procedure is discussed which would allow safe utilization of the full life capacity of each individual component. Since gas turbine rotor components are prime candidates and are among the most costly of engine components, adoption of a RFC maintenance philosophy could result in substantial engine systems life cycle cost savings. Two major technical disciplines must be developed and integrated to realize these cost savings: fracture mechanics and nondestructive evaluation. The methodology and development activity required to integrate these disciplines that provide a viable RFC system for use on military gas turbine engines is discussed. The potential economic benefits of its application to a current engine system are also illustrated. M.G.

N82-22179# Rolls-Royce Ltd., Derby (England). Dept. of Materials Engineering.
DEFECTS AND THEIR EFFECT ON THE BEHAVIOR OF GAS TURBINE DISCS
Robert H. Jeal *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 15 p

Avail: NTIS HC A08/MF A01

Unless the method used to life fatigue critical components like gas turbine discs allows assessment of defect presence and behavior, the risk of serious failure is dramatically increased. A method is discussed where defect behavior can be assessed as part of a total life approach to disc behavior prediction and is explained together with the effects of differing defect types. Such an approach gives realistic manufacturing standards and controls and leads directly to an 'on condition life' approach. Author

N82-22180# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
THE INFLUENCE OF PROTECTIVE TREATMENT ON THE MECHANICAL PROPERTIES OF SUPERALLOY PARTS [INFLUENCE DES TRAITEMENTS DE PROTECTION SUR LES PROPRIETES MECANIQUES DES PIECES EN SUPERALLIAGE]
J. M. Hauser, C. Durat, and R. Pichoir *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 11 p refs In FRENCH
Avail: NTIS HC A08/MF A01

The high temperature environment of aircraft turbine engines requires the use of protective coatings for engine parts. These coatings are particularly necessary when the composition of the superalloys used and associated heat treatment are chosen in order to obtain the best mechanical properties. The durability of these components is determined not only by the mechanical properties of the protected heat resistance alloys, but equally by the resistance of the coating to oxidation and corrosion. To restore this protection can pose diverse problems and, in certain cases, constitute an additional factor in reducing fatigue life. These aspects are considered and illustrated by results obtained from aluminium coatings applied to IN 100 and IN 738LC superalloys. Factors inherent i to t elaboration of the protection are also considered. Transl. by A.R.H.

N82-22185# Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
REPAIR AND REGENERATION OF TURBINE BLADES, VANES AND DISCS
H. Huff and J. Wortmann *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 7 p refs

Avail: NTIS HC A08/MF A01

The repair of incipiently cracked turbine components is essentially limited to non-rotating parts. Repairs to rotating parts are carried out on low-stressed areas, such as seals, only. In this case, weld build-up has proved to be a suitable process. Stator vanes can be high-temperature brazed following reduction annealing. However, problems are encountered when it comes to making sure of the complete removal of oxides. A highly promising method for increasing the reliability of turbine blades that have been in service lies in their regeneration by heat treatment or HIP-processing. Results to date are so positive that the use of regenerated blades may be a reality in the near future. However, a prerequisite for the use of these repair procedures is a guarantee of reliability and a knowledge of the stresses that occur during operation. A.R.H.

N82-22187# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
COMBAT AIRCRAFT MANOEUVRABILITY
Dec. 1981 242 p refs In ENGLISH and FRENCH Proceedings of the Flight Mechanics Panel Symp., Florence, 5-8 Oct. 1981 (AGARD-CP-319; ISBN-92-835-0304-X) Avail: NTIS HC A11/MF A01

The symposium reviewed the operational requirements for combat aircraft maneuverability, technical prospects for maneuverability improvements, and prediction and assessment methods and their value.

N82-22188# Service Techniques des Programmes Aeronautiques, Paris (France). Section Etudes Generalles.
A REVIEW OF RECENT AGARD SYMPOSIA ON THE ANGLE OF MANEUVERABILITY OF COMBAT AIRCRAFT [RETROSPECTIVE DE RECENTS SYMPOSIUMS AGARD SOUS L'ANGLE DE LA MANOEUVRABILITE DES AVIONS DE COMBAT]
Jean-Michel Duc (Service des Recherches/Groupe 6) and Michel Vergne *In* AGARD Combat Aircraft Maneuverability Dec. 1981 50 p refs In FRENCH

Avail: NTIS HC A11/MF A01

The notion of maneuverability, in terms of flight mechanics, as it was treated at meetings of the Fluid Dynamics and Fluid Mechanics Panels during the past ten years is reviewed. Each point discussed is illustrated by graphics taken from previously cited AGARD proceedings. Operational needs, hopes for improvement, methods for prediction, and methods for evaluation of flight qualities at high incidence are examined. A.R.H.

N82-22189# Royal Netherlands Air Force, Soesterberg.
REVIEW OF PRACTICAL EXPERIENCE ON COMBAT AIRCRAFT MAÑEUVERABILITY
A. W. Henni *In* AGARD Combat Aircraft Maneuverability Dec. 1981 8 p
Avail: NTIS HC A11/MF A01

Based upon practical experience in both air to air and air to ground operations with F-84F, F-104G, and NF-5 fighter aircraft, an assessment is given of the importance of combat aircraft maneuverability. In air to ground operations the effect of limited maneuverability on tactics is treated in terms of speed/altitude and maneuverability requirements during ingress/egress and weapon delivery, in relation to attack effectiveness and survivability against enemy defenses. For air to air operations the parameters that influence the outcome of a maneuvering flight are identified. The relation between maneuverability and tactics is discussed. It is concluded that the impact of maneuveriabilty on mission effectiveness becomes less prominent at increasing total number of air to air capable aircraft, fighting in a limited airspace. Dependent on the type of operation, desirable improvements in maneuverability are discussed with emphasis on turn performance (at low speeds), rapid speed changes and direct force generation. In this context human tolerance limits are taken into account. It is stressed that the main problems confronting a fighter pilot in the Central European environment are not related to maneuverability but to the availability of military subsystems. M.G.

N82-22190# Naval Air Systems Command, Washington, D. C.
THE MILITARY FLYING QUALITIES SPECIFICATION, A HELP OR A HINDRANCE TO GOOD FIGHTER DESIGN

Ralph C. AHarrah and Robert J. Woodcock (AFWAL, Wright-Patterson AFB, Ohio) *In* AGARD Combat Aircraft Maneuverability Dec. 1981 13 p refs

Avail: NTIS HC A11/MF A01

Based on experience with Air Force and Naval aircraft, the current qualities specification is evaluated for application to a future fighter design. Analog and digital fly by wire flight control system having multiple redundancy levels and significant control law variation are discussed. Some specific observations are shared on the following topics with regard to the flying qualities in general and the specification in particular time delays, force commands, forward loop integration, high gains, signal blending, equivalent systems, pilot location, high angle of attack, roll performance, and systems integration. In addition, some general observations are made on the use of MIL-F-8785B, and a Navy conducted survey on the effectiveness of the flying qualities specification is discussed. M.G.

N82-22191# Systems Technology, Inc., Hawthorne, Calif.

DEVELOPMENT OF A TENTATIVE FLYING QUALITIES CRITERION FOR AIRCRAFT WITH INDEPENDENT CONTROL OF SIX DEGREES OF FREEDOM: ANALYSIS AND FLIGHT TEST

Roger H. Hoh, Thomas T. Myers, and Irving L. Ashkenas *In* AGARD Combat Aircraft Maneuverability Dec. 1981 12 p refs

(Contract F33615-78-C-3616)

Avail: NTIS HC A11/MF A01

A tentative flying qualities specification for aircraft having direct force effectors that allow independent control over the horizontal and vertical degrees of freedom is presented. Since the primary problem with developing flying qualities for such aircraft is their unconventional responses as reflected in a very incomplete data base. A limited flight test of a direct force control (DFC) aircraft was performed. The requirements are based on fundamental aspects of DFC pilot/vehicle dynamics to insure universal applicability. A bandwidth hypothesis is described which makes the fundamental assumption that the primary factor in the pilot's evaluation of a DFC mode is his ability to exert tight control to minimize errors and thereby achieve improved closed loop tracking performance. The bandwidth is a measure of the maximum frequency at which such closed loop tracking can take place without threatening stability. It follows that airplanes capable of operating at a large value of bandwidth will have superior performance. M.G.

N82-22192# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).

EXPERIMENTAL FLIGHT TEST PROGRAMS FOR IMPROVING COMBAT AIRCRAFT MANEUVERABILITY BY MANEUVER FLAPS AND PYLON SPLIT FLAPS

D. Jacob, D. Welte, and H. Wonnenberg *In* AGARD Combat Aircraft Maneuverability Dec. 1981 11 p refs

Avail: NTIS HC A11/MF A01

Two flight test programs with the Alpha-Jet as test vehicles are described. In the first program the standard wing of the aircraft was replaced by a transonic wing with maneuver flaps. Wind tunnel and flight test results are presented which show the increase in performance and maneuverability based on the improved drag polars and buffet limits. In the second program pylon split flaps were to provide flat turn and side step maneuvers by an alternating deflection of the four left or right split flaps. A drag modulation mode is ralized by symmetrical deflection of all eight flaps. M.G.

N82-22193*# Purdue Univ., Lafayette, Ind. School of Aeronautics and Astronautics.

MULTIVARIABLE CLOSED LOOP CONTROL ANALYSIS AND SYNTHESIS FOR COMPLEX FLIGHT SYSTEMS

David K. Schmidt *In* AGARD Combat Aircraft Maneuverability Dec. 1981 13 p refs

(Grants NAG4-1; AF-AFOSR-0042-72)

Avail: NTIS HC A11/MF A01

A flight control system analysis and synthesis method is presented that is intended to be especially suitable for application to vehicles exhibiting complex dynamic characteristics. For such vehicles quantitative handling qualities specifications are not usually available. Howver, handling qualities objectives are specifically introduced in this method via the hypothesis of correlation between pilot ratings and the objective function of an optimal control model of the human pilot. Further, since augmentation and pilot operate in parallel, simultaneous determination of the augmentation and pilot model gains is required. Desirable augmented dynamics are obtained for a variety of complex systems and the method is experimentally verified in the case of simple pilot damper gain selection for optimum pitch tracking performance. M.G.

N82-22194# General Dynamics/Fort Worth, Tex. Engineering Div.

INTEGRATION OF AVIONICS AND ADVANCED CONTROL TECHNOLOGY

M. E. Waddoups and C. A. Anderson *In* AGARD Combat Aircraft Maneuverability Dec. 1981 4 p

Avail: NTIS HC A11/MF A01

Two seemingly exclusive requirements, low cost tactical fighters and night under the weather operations, are being merged by means of advanced technology. The key operational problem is forced by the extremely difficult timeline for low altitude, high speed, air to surface weapon delivery. The inherent economy of single seat operation can be developed by automation. The key technological problems are caused by the lack of volume in a small fighter. In order to achieve automation of the required tasks, flight path control and sensor interfaces must be developed. Based upon emerging hardware and software technology, flight control and avionic subsystems can be optimized and integrated to achieve capability previously unavailable to small fighters. R.J.F.

N82-22195# Royal Aircraft Establishment, Farnborough (England). Flight Systems Dept.

ENHANCED PILOTING CONTROL THROUGH COCKPIT FACILITIES AND A.C.T.

D. J. Walker (British Aerospace P.L.C., Brough, U.K.) and P. W. J. Fullam *In* AGARD Combat Aircraft Maneuverability Dec. 1981 6 p refs

Avail: NTIS HC A11/MF A01

Total loop control, advanced cockpits, and other aspects of advanced flight control technology are discussed. General maneuvering, force sidestick, depressed roll axis, a nonlinear pitch controller and carefree maneuvering are discussed. R.J.F.

N82-22196*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THE DEVELOPMENT OF CRYOGENIC WIND TUNNELS AND THEIR APPLICATION TO MANEUVERING AIRCRAFT TECHNOLOGY

E. C. Polhamus and R. F. Boyden *In* AGARD Combat Aircraft Maneuverability Dec. 1981 12 p refs

Avail: NTIS HC A11/MF A01

The cryogenic wind tunnel and its potential for advancing maneuvering aircraft technology is discussed. A brief overview of the cryogenic wind tunnel concept and the capabilities and status of the Langley cryogenic facilities is given, as is a review of the considerations leading to the selection of the cryogenic concept such as capital and operating costs of the tunnel, model and balance construction implications, and test condition. Typical viscous, compressibility and aeroelastic effects encountered by maneuvering aircraft are illustrated and the unique ability of the cryogenic wind tunnels to isolate and investigate these parameters while simulating full scale conditions is discussed. The status of the Langley cryogenic wind tunnel facilities is reviewed and their operating envelopes described in relation to maneuvering aircraft research and development requirements. The status of cryogenic testing technology specifically related to aircraft maneuverability studies including force balances and buffet measurement techniques is discussed. Included are examples of research carried out in the Langley 0.3 meter transonic cryogenic wind tunnel to verify the various techniques. R.J.F.

N82-22197# Institut de Mecanique des Fluides de Lille (France).

STATE OF THE ART AND RECENT PERSPECTIVES ON THE STUDY OF THE LOSS OF CONTROL AND SPIN [ETAT DE L'ART ET PERSPECTIVES NOUVELLES RELATIVES A L'ETUDE DE LA PERTE DE CONTROLE ET DES VRILLES]

M. G. Vanmansart and D. R. Tristrant *In* AGARD Combat Aircraft Maneuverability Dec. 1981 18 p refs In FRENCH; ENGLISH summary

Avail: NTIS HC A11/MF A01

Some experimental and analysis methods which contribute to aircraft behavior prediction at high angles and during stall-spin are discussed. A brief review of the methods, their limitations and the expected results, is given, illustrated with a few examples. R.J.F.

N82-22198# Office National d'Etudes et de Recherches speed and number of blades. Since reflection corrections can not successfully be applied to propeller noise signatures, alternative measuring arrangements, such as microphones in close proximity to the ground, were investigated. For different microphone orientations next to an acoustically hard, smooth surface, or above ground plates in case of grass covered surfaces, frequency regimes not affected by ground reflection interferences are determined. Author (ESA)

N82-23068# Committee on Science and Technology (U. S. House).

THE 1983 NASA AUTHORIZATION, VOLUME 1

Washington GPO 1982 114 p Hearing before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 97th Congr., 2nd Sess., No. 71, 17 Feb. 1982
(GPO-91-488-Vol-1) Avail: Subcommittee on Transportation, Aviation and Materials

The status of NASA systems technology programs which provide focused technology applications principally to civil aviation is addressed in light of the cost effectiveness of NASA's partnership with the aircraft industry and the economic impact of the reduction of NASA's roll in promoting advanced aeronautical technology. Progress made in research and technology programs encompassing aerodynamics, propulsion, materials and structures as well as controls and guidance, human factors, and low speed and high speed aircraft technology is reported. The six elements of the Aircraft Energy Efficiency program are highlighted. These are: engine component improvement, energy efficient engine, advanced turboprop, energy efficient transport, composite primary aircraft structures, and laminar flow control. The budget request for these programs is presented. N.W.

N82-23137# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Zentralbereich Entwicklung.

RESEARCH AND DEVELOPMENT AT MBB. TECHNICAL AND SCIENTIFIC PUBLICATIONS, 1981 [FORSCHUNG UND ETWICKLUNG. TECHNISCH-WISSENSCHAFTLICHE VEROEFFENTLICHUNGEN 1981]

1981 193 p refs Partly in ENGLISH and GERMAN
Avail: NTIS HC A09/MF A01

Research and development work carried out during 1981 at Messetschmitt-Bolkow-Blohm GmbH, Ottobrunn, FRG is presented. Aerodynamics, materials science, infrared imagery, aircraft and spacecraft design, and production engineering are discussed. Calculation methods, mathematical and scale models, and computer aided design are treated. Solar energy and high speed trains were investigated.

N82-23140# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Military Aircraft Div.

EXPERIENCE WITH HIGH PERFORMANCE V/STOL FIGHTER PROJECTS AT MBB

Felix Aulehla and Gerhard K. Kissel *In its* Res. and Develop. at MBB. Tech. and Sci. Publ., 1981 1981 16 p refs Presented at AIAA/NASA Ames V/STOL Conf., Palo Alto, Calif. 7-9 Dec. 1981
(MBB-FE-124/S/PUB/50) Avail: NTIS HC A09/MF A01

Experience gained with V/STOL aircraft having the capability to reach Mach 2 and to take off at after-burning temperatures is described. The German project VJ 101 C and the U.S./FRG project AVS as well as the joint U.S./FRG V/STOL Technology Program serve as examples. Guidance and control systems are depicted, including hover and transition control. Jet interference aspects, e.g., hot gas ingestion during take off with reheated jets are described. Author (ESA)

N82-23141# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Aeroelastic Branch.

APPLICATION OF A STRUCTURAL OPTIMIZATION PROCEDURE FOR ADVANCED WINGS

Heinrich Goedel and Guenter Schneider *In its* Res. and Develop. at MBB. Tech. and Sci. Publ., 1981 1981 15 p refs Presented at 51st AGARD Meeting on Struct. and Mater. Panel, Aix-en-Provence, France, 14-19 Sep. 1981

(MBB-FE-171/S/PUB/49; AGARD-691) Avail: NTIS HC A09/MF A01

A finite element method optimization program was applied to: the sizing of a simplified metal wing for strength and flutter constraints; aeroelastic efficiency calculations for fin and rudder; and the structural layout of a carbon fiber composite delta wing. A flutter speed is calculated for the initial fully stressed design being 700 kt. After 5 iterations the desired flutter speed of 900 kt is reached with an increase < 3% total weight. Good correlation with more sophisticated analyses, e.g., NASTRAN is achieved. The aeroelastic deformation of a fin and rudder are calculated statisfactorily without iteration using the aerodynamic influence matrix produced by a separate program module. A 5% weight saving is achieved for the delta wing. Aileron aeroelastic efficiency is above specification for a supersonic roll. Author (ESA)

N82-23150# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

FLUID DYNAMICS OF JETS WITH APPLICATIONS TO V/STOL

Jan. 1982 433 p refs Proceedings of Symp. held at Lisbon, 2-5 Nov. 1981
(AGARD-CP-308; ISBN-92-835-0308-2) Avail: NTIS HC A19/MF A01

The fluid dynamics of vertical and short take-off and landing aircraft which employ thrust vectoring or lift augmentation were discussed. Jet interactions with neighboring surfaces, jet structure and development, wind tunnel simulation, injection and thrust augmentation, and theoretical models were considered.

N82-23151# Surrey Univ., Guildford (England). Dept. of Mechanical Engineering.

SOME ASPECTS OF JET DYNAMICS AND THEIR IMPLICATIONS FOR VTOL RESEARCH

L. J. S. Bradbury *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 26 p refs

Avail: NTIS HC A19/MF A01

Some of the problems associated with jet interference on VTOL aircraft are discussed. The jet interference that arises in hovering both in and out of ground effect is considered first and the factors that influence the entrainment that is responsible for the interference are discussed. In particular, it is shown that the flow in the initial region of a jet is strongly affected by circumferential variations in the jet nozzle flow angle and that this might account for some of the anomolous results for the decay of jets issuing from VTOL models. The possible use of Reichardt's method for studying the behavior of nonuniform jets is also discussed. The problem of jet interference in transition is next examined and the basis on which model tests are currently carried out is briefly reviewed. The dynamics of jet interference in transition are then considered in more detail and it is suggested that unlike interference in hovering, transition interference might well be accounted for on the basis of a potential flow model of the jet in a cross flow. Some experimental evidence in support of this notion is examined and a few examples of comparisons between predicted and experimental pressure distributions around a single jet issuing from a flat plate are given. Author

N82-23158# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Aircraft Div.

AN EXPERIMENTAL AND THEORETICAL INVESTIGATION OF THE INTERACTION BETWEEN THE ENGINE JET AND THE SURROUNDING FLOW FIELD WITH REGARD TO THE PRESSURE DRAG ON AFTERBODIES

A. Zacharias *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 22 p refs

Avail: NTIS HC A19/MF A01

In order to clarify the interaction between rotationally symmetric engine jets and afterbody configurations, the dependence of the jet characteristics (i.e., the plume effect and the entrainment) and the afterbody pressure drag on the jet parameters, the free stream Mach number, and the afterbody geometry was analyzed. Extensive tests were carried out in the high subsonic Mach number range on three different afterbodies at Reynolds numbers from 500,000 to 1,300,000. The nozzle pressure ratio and the temperature ratio of the model jets were varied in the range (1.0) 1.2 to 2.4 and 1.0 to 2.86 respectively. Measurements were then carried out to determine the static pressure and temperature distribution as well as the boundary layer profiles over the surface of the models. At the same time, the pressure and temperature profiles in the jet were determined in several planes behind the jet exhaust plane. Empirical equations are presented which show the dependence of the plume effect, the entrainment, and the afterbody pressure drag on the jet parameters, the free stream Mach number, and the afterbody geometry. With the aid of a finite element method and theoretical potential flow model for jet simulation, a numerical procedure was developed which allows the pressure drag on rotationally symmetric afterbodies to be calculated with due allowance for the effects of the engine jets. Comparison of the theoretical and experimental results shows satisfactory agreement. J.D.

N82-23164# Technische Hochschule, Aachen (West Germany). Inst. fuer Luft- und Raumfahrt.

FLOWFIELD AND NOISE SOURCES OF JET IMPINGEMENT OF FLAPS AND GROUND SURFACE

Guenther Neuwerth *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 7 p refs

Avail: NTIS HC A19/MF A01

On the basis of experimental results it is shown that, in an undisturbed free jet of high subsonic speed as well as in a jet deflected by externally blown flaps (EBF), there are ordered turbulence structures. First, a feedback mechanism which develops at small distances between nozzle and stagnation point on the flaps and which amplifies the turbulence structures is explained. It is subsequently shown that the interaction of the jets and EBF generates a strong noise. Even without feedback both the undisturbed free jet and the jet deflected by EBF have the maximum levels in the noise spectrum at the Strouhal numbers of the natural ordered turbulence structures. Author

N82-23165*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

JET V/STOL WIND-TUNNEL SIMULATION AND GROUND-PLANE EFFECTS

Richard J. Margason *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 21 p refs

Avail: NTIS HC A19/MF A01 CSCL 01A

The pretest preparation necessary to define the objectives of an appropriate investigation into the jet V/STOL wind tunnel simulation and ground plane effects were examined. Low speed wind tunnel testing of V/STOL aircraft concepts to determine the aerodynamic propulsion interaction effects during the transition between hover and wingborne flight is a necessary step in the development cycle of this type of aircraft. Powered models are normally used to determine the aerodynamic performance characteristics. Several factors which influence the selection of the model concept and the engine simulator are discussed. Some of the test techniques important for this class of aircraft model are examined. Wind tunnel wall effects important to this aircraft testing with special emphasis on groundplane effects are reviewed. E.A.K.

N82-23166*# McDonnell-Douglas Corp., St. Louis, Mo. Aerodynamics Dept.

THE MODELING AND PREDICTION OF MULTIPLE JET VTOL AIRCRAFT FLOW FIELDS IN GROUND EFFECT

Donald R. Kotansky *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 20 p refs

(Contracts NAS2-9646; NAS2-10184; N62269-76-C-0086; N00014-79-C-0130)

Avail: NTIS HC A19/MF A01 CSCL 01A

An engineering methodology based on an empirical data base and analytical fluid dynamic models was developed for the prediction of propulsive lift system induced aerodynamic effects for multiple lift jet VTOL aircraft operating in the hover mode in and out of ground effect. The effects of aircraft geometry, aircraft orientation (pitch, roll) as well as height above ground are considered. Lift jet vector and splay directions fit the airframe, lift jet exit flow conditions, and both axisymmetric and rectangular nozzle exit geometry are also accommodated. The induced suckdown flows are computed from the potential flowfield induced by the turbulent entrainment of both the free jets and wall jets in ground effect and from the free jets alone out of ground effect. The methodology emphasized geometric considerations, computation of stagnation lines and fountain upwash inclination, fountain upwash formation and development, and fountain impingement on the airframe. E.A.K.

N82-23167# Grumman Aerospace Corp., Bethpage, N.Y.

EVALUATION OF THE EFFECTS OF MODEL SCALE AND TEST TECHNIQUE ON JET-INDUCED EFFECTS

Stanley G. Kalemaris *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 11 p

Avail: NTIS HC A19/MF A01

The effects of model scale and test technique on the jet induced of a twin turbofan V/STOL aircraft were evaluated. The smallest mode was 2.1% as large as the full scale model. It is found that the two most important items to be modeled are fuselage shape and the coannular nature of a typical turbofan exhaust. Lift enhancing strakes are effective in enhancing the ground cushion and eliminating a possible source of scale effect. E.A.K.

N82-23168# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

JET EFFECTS ON FORCES AND MOMENTS OF A VSTOL FIGHTER TYPE AIRCRAFT

B. Haftmann *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 13 p refs

Avail: NTIS HC A19/MF A01

Results of jet effects on forces and moments of the VAK-191 B were compiled. The jet induced effects were investigated during the Vertical/Short Take-Off and Landing (VSTOL) mode in and out of ground effect, in yawed flight, during hover and transition right up to aerodynamic flight. The flight test results were compared with wind tunnel measurements performed during the VAK-191 B development phase and used for preparation of simulation and automatic flight control system development. Trends and deviations between aircraft and model test results are verified. The adequacy of wind tunnel data preparation are questioned. The practicability of wind tunnel data for the assessment of VSTOL aircraft design and determination of flight characteristics and performances are discussed. Recommendations for the measurements of jet induced forces and moments on VSTOL aircraft are outlined. E.A.K.

N82-23169# Aeronautical Research Associates of Princeton, Inc., N. J.

THRUST AUGMENTING EJECTORS: A REVIEW OF THE APPLICATION OF JET MECHANICS TO V/STOL AIRCRAFT PROPULSION

Brian Quinn *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 14 p refs

Avail: NTIS HC A19/MF A01

The fundamental role played by the fluid dynamics of jets within thrust augmenting ejectors that are designed as propulsive units for V/STOL aircraft were reviewed. Energy transfer efficiency and its impact on the production of thrust is discussed. It is explained why propellor like devices more effectively convert available energy to thrust and that overall ejector performance is very sensitive to losses sustained by individual components. The most important loss mechanism is incomplete mixing between the ejector's primary and entrained streams. An experimental data base that provides insight into interactions between turbulent mixing and other factors and improving mixing and ejector performance are reviewed. Free mixing and mixing in a confined environment are contrasted and it is concluded that the development of theoretical methods that successfully predict the performance of V/STOL ejectors must await the results of new experiments that measure turbulence intensities and Reynolds stresses in confined regions. E.A.K.

N82-23170# Centre d'Etudes et de Recherches, Toulouse (France). Dept. of Aerothermodynamique.

THEORETICAL OPTIMISATION AND EXPERIMENTAL VERIFICATION OF AN INJECTOR

A. Mignosi *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 12 p refs In FRENCH; ENGLISH summary

Avail: NTIS HC A19/MF A01

A modelization of induction systems, which could be used for thrust augmentation or more generally constitute a fluid drive system, is proposed for the steady regime case. A simple scheme in which a rapid mixing of the flows is assumed, allows to solve the basic equations and express the main parameters influence. Its verification is effected, using a set of experimental data obtained during the study of an induction driven wind-tunnel.

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Aerodynamic noise generated by jet-wing/flap interactions of the external USB configuration of STOL aircraft. Part 1: Eight percent scale cold-flow model analysis
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N82-22197
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Flutter of forward swept wings, analyses and tests
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Research and Technology annual report FY-1981
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AEROSPACE ENGINEERING
The Royal Aircraft Establishment: 100 years of research
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Critical metals conservation, recycling and substitution
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A82-29836 † The stability of monocoque panels under bending (Ustoichivost' panelei kessona pri izgibe). V. I. Shalashilin, O. B. Lozhkin, and V. A. Nagaev. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 60-65. In Russian.

An analysis is presented of the elastic stability of cylindrical monocoque panels under bending. The critical loading conditions are investigated, and the selection of parameter values for the discrete transverse reinforcement is considered. B.J.

A82-29837 † Application of a dimensionless criterion of transport efficiency in evaluating aircraft modifications (O primenenii bezrazmernogo kriteriia transportnoi effektivnosti v otsenkakh modifikatsii samoletov). V. N. Sheptunov. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 65-70. 6 refs. In Russian.

A dimensionless criterion of transport efficiency (defined as the ratio of aircraft performance to energy consumed in cruising flight) is proposed, and its possible applications are considered. The relationship between transport efficiency and cost efficiency is established, and a method is developed for estimating the cost efficiency of aircraft design solutions and modifications on the basis of the relationship between the dimensionless criterion and transport costs. A numerical example is discussed. B.J.

A82-29838 † Zone loading of flight-vehicle structures (Zonnoe nagruzhenie konstruktsii letatel'nykh apparatov). V. S. Azarin and B. L. Patsenker. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 71-73. 5 refs. In Russian.

A82-29841 † Analysis of shells of straight-wing type (K raschetu obolochek tipa priamogo kryla). S. N. Bulatov and P. N. Kurochka. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 80-83. In Russian.

Obraztsov's (1966, 1973) approach is used to develop a method for the analysis of variable-thickness shells of arbitrary cross section. The resolvent system is obtained by means of the Lagrange variational principle. The solutions are obtained in the form of expansions whose first terms correspond to the hypothesis of plane sections, while the other terms take into account displacements caused by warping. B.J.

A82-29844 † Thermal stability analysis for conical shells with variable parameters (Raschet termoprochnosti konicheskikh obolochek s peremennymi parametrami). V. R. Kotel'nikov. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 90-93. In Russian.

A method based on an approximate solution of an integral elasticity equation is proposed for analyzing, at an early design stage, thermoelastic stress-strain state of thin-walled conical shells with variable parameters. The proposed method is demonstrated in a case involving analysis of the effect of the wall thickness profile on the stress-strain state of a shell for specified temperature distributions. It is shown that thinning of the shell in the direction of the larger base results in increased stresses and shifting of the maximum stresses to the region of higher temperatures. It is therefore recommended that the wall increase in thickness toward the larger base. V.L.

A82-29845 † Determination of an optimal control program for an aircraft power plant during climb (Opredelenie optimal'noi programmy upravleniia silovoi ustanovkoi samoleta na uchastke razgona-nabora vysoty). O. K. Iugov. *Aviatsionnaia Tekhnika,* no. 4, 1981, p. 96-98. In Russian.

The paper examines the development of an optimal control program for an aircraft power plant during climb on the basis of a criterion of minimum fuel consumption. Theoretical results obtained using this approach are presented, and attention is given to the validity of the assumption of the constant flight weight of aircraft at subsonic and supersonic speeds in calculating longitudinal acceleration loading during climb. B.J.

A82-29871 # Sudden changes in wind velocity - Their effect on aircraft and means of reducing hazard. I (Uskok wiatru - Dzialanie na samolot, srodki zmniejszajace zagrozenie. I). J. M. Morawski and T. Smolicz (Instytut Lotnictwa, Warsaw, Poland). *Technika Lotnicza i Astronautyczna,* vol. 37, Apr. 1982, p. 5, 6. In Polish.

The effect of abrupt changes in wind velocity and direction on the trajectory and aerodynamic stability of aircraft are examined and possible counter measures, including flying techniques and the use of special devices, are suggested. Expressions are presented for calculating the downward drift angle and the effect of horizontal wind currents. V.L.

A82-29872 # Analysis of changes in the gas-dynamic parameters of a gas-turbine helicopter engine during acceleration (Analiza przebiegu parametrow gazodynamicznych i mocy turbinowego silnika smiglowcowego podczas przyspieszania). E. Jaworski. *Technika Lotnicza i Astronautyczna,* vol. 37, Apr. 1982, p. 13-17. In Polish.

Changes in the gas-dynamic parameters of a gas-turbine engine during acceleration are analyzed using the results of a mathematical model for the engine transients. The parameters examined include compressor and rotor rpm, compression ratio and air flow rate, margin of stability, turbine inlet temperature, excess air ratio, turbine pressure drop, and engine power. The effects of the working medium inertia and mass and heat accumulation on the transient processes in the engine are also discussed. V.L.

A82-29880 † Numerical study of vibrational relaxation in the turbulent mixing of jets in a supersonic nozzle (Chislennoe issledovanie kolebatel'noi relaksatsii pri turbulentnom smeshenii strui v sverkhzvukovom sople). A. V. Lavrov and V. A. Pospelov (Leningradskii Politekhnicheskii Institut, Leningrad, USSR). *Inzhenerno-Fizicheskii Zhurnal,* vol. 42, Apr. 1982, p. 586-592. 23 refs. In Russian.

The turbulent boundary layer equations are used to examine gasdynamic and physical processes in the nozzle and resonator of a CO2 gasdynamic laser with selective thermal excitation. In order to verify the adequacy of the proposed mathematical model of the laser, a comparison is made with experimental data for various values of stagnation temperature and pressure; good agreement between theoretical and experimental results is found. The effects of the composition of the secondary jet, and stagnation temperature and pressure on specific energy output are investigated. It is shown that, at high pressures and temperatures, sufficiently high specific outputs can be obtained only in the case of optimal CO2 concentration in the secondary jet. B.J.

A82-29923 Air Traffic Flow Management and Air Traffic Flow Control (Air Traffic Flow Management und Air Traffic Flow Control). R. Küttner (Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt,* vol. 17, no. 4, 1981, p. 172-177. 7 refs. In German.

The growth in the volume of air traffic and the concentration of air traffic in certain areas and during certain time periods have caused operational difficulties for a number of area control centers (ACC) and approach control offices (APP) in the German Democratic Republic. These difficulties are related to an insufficient capacity of ACC and APP to cope with peak traffic demands, because, in connection with economic considerations, it is often not possible to design installations for peak demands. Two approaches are used to reduce the considered difficulties as much as possible. The approach of Air Traffic Flow Management (ATFM) involves the assignment of a certain flight to a specific time slot. There are generally no delays, if the resulting requirements are met. The approach of Air Traffic Flow Control is only employed if the ATFM process is unsuitable. Air Traffic Flow Control specifies the number of aircraft which can enter per unit of time. G.R.

A82-29924 Flight simulators (Flugsimulatoren). G. Westphal (Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt,* vol. 17, no. 4, 1981, p. 180-189. 5 refs. In German.

Simulation involves the employment of models. A 'model' is a material or a conceptual system which corresponds to the object to be simulated on the basis of certain analogies. Flight simulators are concerned with the simulation of conditions and events occurring during the flight of an aircraft. With respect to their employment, the simulators can be divided into devices for research and for training. Research simulators make it possible to achieve an optimum design for the man-machine system in the cockpit of modern aircraft. The reasons for the employment of flight simulators in the training programs for the pilots of airlines are discussed, taking into account also the various subsystems used in the simulator. Particular attention is given to the cockpit, the computer, and the system providing a simulation of the visual scene. G.R.

A82-29925 **New processes and methods of technical diagnostics and prognostics in the case of the engine NK-8-4. II (Neue Verfahren und Methoden der technischen Diagnostik und Prognostik beim Triebwerk NK-8-4. II).** S. Jung (Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt,* vol. 17, no. 4, 1981, p. 193-195. In German.

A82-30004 **Composite bonds improve thermal integrity.** A. Kleider (U.S. Army, Avionics Laboratory, Fort Monmouth, NJ), J. T. Johnson (Westinghouse Defense and Electronic Systems Center, Baltimore, MD), and R. L. Kolek (Westinghouse Electric Corp., Marine Div., Sunnyvale, CA). *ManTech Journal,* vol. 6, no. 3, 1981, p. 37-41. Army-supported research.

Production process considerations which, once solved, permitted fabrication of 1000 parts/yr of stabilized line-of-sight gimbals for aircraft electrooptical systems and sensors are discussed. A thermal sample was fabricated of composites to evaluate the expansion characteristics for mating bearings to the bore with resultant constant friction and stiffness values over the operating temperature range. Titanium rings were chosen to interface with the outer bearing race, and a series of thermal cycles were performed in order to test the bonds. Procedures of a design change and implementation are outlined, noting the final design called for 121 parts, some formed with expandable internal mandrels. Curing conditions for the fiber composite structures are detailed, including formation of the base plate stiffener ring. The gimbal produced features a 33% weight savings over previous gimbals. M.S.K.

A82-30076 **Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1 - Structures and materials. Part 2 - Structural dynamics and design engineering.** Conference sponsored by AIAA, ASME, ASCE, and AHS. New York, American Institute of Aeronautics and Astronautics, 1982. Pt. 1, 532 p.; pt. 2, 646 p. Price of two parts, members, $100.; nonmembers, $125.

An integration scheme to determine the dynamic response of a launch vehicle with several payloads is considered along with aeroelastic characteristics of the Space Shuttle external tank cable trays, the structural design of integral tankage for advanced space transportation systems, and optimum damping locations for structural vibration control. Attention is given to a damage induced aeroelastic failure mode involving combination and parametric resonant instabilities of lifting surfaces, passive damping mechanisms in large space structures, an automated technique for improving modal test/analysis correlation, pressure measurements on twin vertical tails in buffeting flow, and a wind-tunnel study of the aerodynamic characteristics of a slotted versus smooth-skin supercritical wing. Other topics explored are related to the active control of aeroelastic divergence, stress constraints in optimality criteria design, and damage tolerant design using collapse techniques. G.R.

A82-30087 * # **Effects of 50,000 hours of thermal aging on graphite/epoxy and graphite/polyimide composites.** J. R. Kerr and J. F. Haskins (General Dynamics Corp., Convair Div., San Diego, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 101-108. Contract No. NAS1-12308. (AIAA 82-0657)

Thermal effects on tensile strengths of advanced composite systems have been determined for exposure times of 100 to 50,000 hours (5.7 years). Exposures were conducted at both ambient and reduced pressures at two temperatures for each composite. At the completion of the various aging periods, specimens were removed from the specially constructed aging furnaces, visually examined, and tensile tested at elevated temperature. After tensile testing, many of the thermal aging specimens were examined using a scanning electron microscope. Results of these studies are presented, and the changes in properties and the degradation mechanisms during high-temperature aging are discussed and illustrated using metallographic techniques. (Author)

A82-30091 # **A comparison of properties of single overlap tension joints prepared by ultrasonic welding and other means.** T. Renshaw, K. Wongwiwat, and A. Serrantonio (Fairchild Republic Co., Farmingdale, NY). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 137-144. (AIAA 82-0661)

An employment of the ultrasonic welding process in aircraft assembly operations might possibly lead to an achievement of very significant cost and weight reductions. A development program has been in progress with the objective to realize the potentials of the ultrasonic welding process for aircraft production. The present investigation represents an extension of studies reported by Renshaw and Serrantonio (1980). It had been found that large, single overlap joints made with ultrasonic spotwelds could be loaded to sheet stresses above the yield strength. Tests conducted in the current investigation cover series of interlayer situations which can exist in the assembly of aircraft. Fatigue data are also reported for the joints. Other types of joints than ultrasonically welded ones were also prepared and tested in order to develop directly comparable static and fatigue properties. Weight and cost comparisons are included. G.R.

A82-30096 # **Finite element analysis of through the canopy emergency crew escape from the T-38 aircraft.** R. E. McCarty and R. A. Smith (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 197-205. 15 refs. (AIAA 82-0705)

The nonlinear static response to a concentrated load on the inner surface of the student pilot canopy for the T-38 aircraft has been predicted using the MAGNA (Materially and Geometrically Nonlinear Analysis) finite element computer program. The analyses conducted were intended to simulate the impingement on the canopy inner surface of a breaker located on the student pilot ejection seat. Criteria for defining fracture of the canopy were selected and work required to fracture the canopy was then determined from computed nonlinear load-displacement curves. The static load and work required to fracture two proposed bird-resistant designs for the T-38 student canopy were compared to those required to fracture the current design. It is concluded that transparency penetration for emergency crew escape via ejection seat breaker impingement on the T-38 student canopy is probably not feasible for a 0.68 in. thick monolithic stretched acrylic bird-resistant design. The same mode of transparency penetration might prove feasible for a 0.40 in. thick monolithic polycarbonate bird resistant design. (Author)

A82-30099 * # **Mechanical properties of a fiberglass prepreg system at cryogenic and other temperatures.** P. J. Klich and C. E. Cockrell (NASA, Langley Research Center, Systems Engineering Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 223-230. 9 refs. (AIAA 82-0708)

The compressor driving the flow in the National Transonic Facility, which is nearing completion at the Langley Research Center, has 25 fiberglass blades. E-glass cloth with a pre-impregnated epoxy resin has been selected as the material for the fan blades because of its low cost, high damping, and fatigue resistance. A complete characterization is presented of this fan blade fiberglass system at temperatures of 367 K, room temperature, and 89 K. The characterization test results suggest that the material follows the general trends of metals and other glass-reinforced plastics at cryogenic temperatures. A slight diminution in strength was observed at the elevated temperature. The tests included the following: tensile, compression, fatigue, inplane shear, interlaminar shear, thermal expansion, creep, and thermal cycle. C.R.

A82-30102 # **Damping and stiffness of aligned discontinuous fiber reinforced polymer composites.** R. F. Gibson, C. T. Sun, and S. K. Chaturvedi (Florida, University, Gainesville, FL). In:

Aerospatiales, Paris (France).

APPLICATION OF THE THEORY OF BIFURCATIONS TO THE STUDY OF THE LOSS OF CONTROL IN COMBAT AIRCRAFT [APPLICATION DE LA THEORIE DS BIFURCATIONS A L'ETUDE DES PERTES DE CONTROLE SUR AVION DE COMBAT]

Phillipe Guichetsau *In* AGARD Combat Aircraft Maneuverability Dec. 1981 13 p refs In FRENCH

Avail: NTIS HC A11/MF A01

Aircraft motion can be described in a rigorous manner by a nonlinear differential system, depending on parameters, joining variables of state (incidence, side-slip, speed ...) and variable control (positioning of rudders) by means of equations of flight mechanics and an aerodynamic model. The proposed method consists of determining the stability limits of the system, and of predicting the evolution of that which becomes unstable. It is based on the theory of bifurcation of nonlinear differential systems. A.R.H.

N82-22199# Vought Corp., Dallas, Tex. Aerodynamics Div.

PREDICTIONS OF AERODYNAMIC CHARACTERISTICS OF HIGHLY MANEUVERABLE CONFIGURATIONS

W. B. Brooks and T. D. Beatty *In* AGARD Combat Aircraft Maneuverability Dec. 1981 6 p refs

Avail: NTIS HC A11/MF A01

The ability of a variety of currently available methods to predict the lateral/directional characteristics of arbitrary configurations is discussed. The programs surveyed generally had either nonlinear or arbitrary body capability, but not both. Published comparisons between the hypersonic arbitrary body program and experimental data suggested a direct extension of the commonly used Allen-Jorgenson cross flow analogy to arbitrary bodies. Though useful, this extension of the Allen-Jorgenson method did not include dynamic pressure losses on aft lifting surfaces. An examination of a nonlinear approach which computes the forces on a combined body/separated region contour and corrects these forces by an empirical momentum deficit in the separated region was begun. For axisymmetric bodies the method reduces to the standard Allen-Jorgenson cross flow approach. Two potentially major advantages over the Allen-Jorgenson method are that the method does provide a model for predicting body fin interaction and that the method is extendable to arbitrary bodies. R.J.F.

N82-22200# British Aerospace Aircraft Group, Preston (England). Aerodynamics Dept.

AEROELASTIC TAILORING FOR CONTROL AND PERFORMANCE: ARE REQUIREMENTS COMPATIBLE?

D. Booker *In* AGARD Combat Aircraft Maneuverability Dec. 1981 4 p refs

Avail: NTIS HC A11/MF A01

The variations of camber and twist along a wing required for optimum performance in low 'g' (cruise) and high 'g' (combat) flight are discussed. It is shown that a wing with active leading edge and trailing edge maneuverer devices scheduled with angle of attack, and structurally tailored to control aeroelastic bending and torsion, can approach optimum performance. However the torsional stiffness of such a wing may be too low for satisfactory roll control at high airspeeds in supersonic flight. Some compromise to performance is implied if torsional stiffness has to be increased to provide adequate control capability. Author

N82-22201# Northrop Corp., Hawthorne, Calif. Aircraft Div.

TAIL CONFIGURATIONS FOR HIGHLY MANEUVERABLE COMBAT AIRCRAFT

W. E. Fellers, W. S. Bowman, and P. T. Wooler *In* AGARD Combat Aircraft Maneuverability Dec. 1981 18 p

Avail: NTIS HC A11/MF A01

The drag due to lift, maximum lift, and stability and control characteristics of tailless, canard, and aft tail configurations of highly maneuverable combat aircraft, using both aerodynamic surfaces and vectored thrust for pitch control are evaluated. The same low aspect ratio wing planform was used on all the configurations. Control configured vehicle concepts were employed. Variable wing camber employing leading edge and trailing edge flaps was used to reduce profile drag. The center of gravity was located as far aft as allowed by the stability and control criteria, in order to reduce subsonic and supersonic trim drag. The critical pitch control criterion was found to be the providing of adequate nose down pitch acceleration in the angle of attack region near maximum lift. The aft center of gravity limits for both tailless and canard configurations without pitch thrust vectoring were required to be forward of the optimum location for minimum subsonic maneuver trim drag. The aft tail configuration was not limited in this manner. In addition it could attain a higher subsonic maximum lift. It also had a greater design flexibility since the aft center of gravity limit could be influenced by the tail area. For these reasons it was the preferred configuration. B.W.

N82-22202# Avions Marcel Dassault-Breguet Aviation, Saint-Cloud (France).

EVALUATION OF AIRCRAFT IN SIMULATED COMBAT: COMPUTER AGAINST COMPUTER OR COMPUTER AGAINST HUMAN PILOT [EVALUATION D'AVIONS EN COMBAT SIMULE CALCULATEUR CONTRE CALCULATEUR OU CALCULATEUR CONTRE PILOTE HUMAIN]

J. Pedotti and Y. Hignard (Centre Electronique de l'Armement) *In* AGARD Combat Aircraft Maneuverability Dec. 1981 14 p refs In FRENCH

Avail: NTIS HC A11/MF A01

A program was developed for simulating one aircraft in combat with another. The adaptive logic of aerial maneuvers (LAMA) program was validated by theoretical studies and by pilot/model tests on the CELAR simulator. The program permits either an entirely numerical model or a simulation of interactive hostility against a pilot on a simulator. Not only does the program provide a means for studying new weapons systems, it also provides a hostile performer for training pilots. A.R.H.

N82-22203# Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.

THE ASSESSMENT OF AIRCRAFT COMBAT EFFECTIVENESS USING A NEW COMPUTATIONAL METHOD

Michael Falco and Gilbert Carpenter *In* AGARD Combat Aircraft Maneuverability Dec. 1981 11 p refs Sponsored in part by Army Aviation Research and Development Command

Avail: NTIS HC A11/MF A01

A computational method for the assessment of aircraft combat effectiveness in the design concept phase is discussed. The approach employs a stochastic learning method, in conjunction with dynamic simulation, to derive aircraft maneuver strategies in the form of a feedback control based upon a discretized set of threat visual or warning system cues. The derived strategies maximize either survival probability of kill probability in the one on one setting. Computational results are presented for selected aircraft designs in missile and gun combat. B.W.

N82-22204# McDonnell-Douglas Corp., St. Louis, Mo. Operations Analysis Dept.

EVALUATION OF DIRECT FORCE MODE FIGHTERS BY COMBAT SIMULATION

C. H. Guthrie *In* AGARD Combat Aircraft Maneuverability Dec. 1981 13 p

Avail: NTIS HC A11/MF A01

Advanced fighter concepts which have been significantly influenced by air combat simulation are discussed. Both man in the loop and digital combat simulation are excellent tools for developing and screening advanced fighter concepts. One important application is the evaluation of fighters with high authority aerodynamic and propulsive controls. Manned and digital air combat simulations showed that high authority controls substantially increase combat effectiveness when used both for enhance large scale maneuverability and for automatic pointing of the fuselage. Digital simulation showed that fighters with high authority direct force modes require lower sustained load factors than conventional designs for a constant level of effectiveness in close in combat. Therefore, fighters with direct force modes can be lighter and less expensive than conventional aircraft. In a manned simulation of close in combat, single fighters with several levels of aerodynamic and propulsion control authority were flown against two threat fighters of equal instantaneous sustained turn rate capability and with identical avionics and armament. For the fighter configured with the highest authority controls, many measures of engagement control and effectiveness were double those of the conventional (baseline) fighter. B.W.

N82-22205# British Aerospace Aircraft Group, Preston (England).

THE STUDY OF COMBAT AIRCRAFT MANEUVERABILITY BY AIR TO AIR COMBAT SIMULATION
A. G. Barnes *In* AGARD Combat Aircraft Maneuverability Dec. 1981 9 p
Avail: NTIS HC A11/MF A01

Air to air combat by ground based simulation and its contribution to the design, development and operational use of combat aircraft is evaluated. The merits of different aircraft/missile combinations can be assessed under controlled conditions with pilot involvement. Parameters which influence maneuverability, such as sustained turn rate, attained turn rate, and SEP can be easily varied, and translated into combat success. The relative importance of these parameters are discussed in the light of experimental results. B.W.

N82-22206*# Old Dominion Univ., Norfolk, Va. Dept. of Mechanical Engineering and Mechanics.
AERODYNAMIC PERFORMANCE OF SLENDER WINGS WITH SEPARATED FLOWS Technical Report, period ending 31 Dec. 1981
C. Subba Reddy Mar. 1982 64 p refs
(Grant NsG-1561)
(NASA-CR-168768; NAS 1.26:168768) Avail: NTIS HC A04/MF A01 CSCL 01A

The aerodynamic performance of low aspect ratio sweptback wings with vortex flows was numerically investigated using the free vortex sheet method. The models studied included flat, cambered, strake, and leading edge flapped wings of different planforms. The theoretical results predicted by the method were compared with the existing experimental data wherever available; and the code capabilities and limitations were explored. Also the effects of the wing thickness, fuselage, leading edge flap and multiple vortex modeling on the aerodynamic characteristics were studied. Author

N82-22207*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL INVESTIGATION OF THE POWERED LOW-SPEED LONGITUDINAL AERODYNAMICS OF THE VECTORED-ENGINE-OVER (VEO) WING FIGHTER CONFIGURATION
John W. Paulson, Perry D. Whitten (General Dynamics Corp., Fort Worth, Tex.), and Stephen C. Stumpfl (AFWAL) Mar. 1982 274 p refs
(NASA-TM-83263; NAS 1.15:83263) Avail: NTIS HC A12/MF A01 CSCL 01A

A wind-tunnel investigation incorporating both static and wind-on testing was conducted in the Langley 4- by 7-Meter Tunnel to determine the effects of vectored thrust along with spanwise blowing on the low-speed aerodynamics of an advanced fighter configuration. Data were obtained over a large range of thrust coefficients corresponding to takeoff and landing thrust settings for many nozzle configurations. The complete set of static thrust data and the complete set of longitudinal aerodynamic data obtained in the investigation are presented. These data are intended for reference purposes and, therefore, are presented without analysis or comment. The analysis of the thrust-induced effects found in the investigation are not discussed. Author

N82-22208*# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
INVESTIGATION OF PASSIVE SHOCK WAVE-BOUNDARY LAYER CONTROL FOR TRANSONIC AIRFOIL DRAG REDUCTION Final Report, 1 Oct. 1979 - 30 Sep. 1981
H. T. Nagamatsu, W. B. Brower, Jr., L. Bahi, and J. Ross Apr. 1982 204 p refs
(Grant NsG-1624)
(NASA-CR-168844; NAS 1.26:168844) Avail: NTIS HC A10/MF A01 CSCL 01A

The passive drag control concept, consisting of a porous surface with a cavity beneath it, was investigated with a 12-percent-thick circular arc and a 14-percent-thick supercritical airfoil mounted on the test section bottom wall. The porous surface was positioned in the shock wave/boundary layer interaction region. The flow circulating through the porous surface, from the downstream to the upstream of the terminating shock wave location, produced a lambda shock wave system and a pressure decrease in the downstream region minimizing the flow separation. The wake impact pressure data show an appreciably drag reduction with the porous surface at transonic speeds. To determine the optimum size of porosity and cavity, tunnel tests were conducted with different airfoil porosities, cavities and flow Mach numbers. A higher drag reduction was obtained by the 2.5 percent porosity and the 1/4-inch deep cavity. T.M.

N82-22211*# Boeing Commercial Airplane Co., Seattle, Wash.
AERODYNAMIC ANALYSIS OF VTOL INLETS AND DEFINITION OF A SHORT, BLOWING-LIP INLET Final Report
J. Syberg and A. L. Jones Apr. 1982 81 p refs
(Contract NAS3-22389)
(NASA-CR-165617; NAS 1.26:165617; D6-51418) Avail: NTIS HC A04/MF A01 CSCL 01A

The results indicated that, without boundary layer control, either a very long inlet or an inlet with a very high contraction ratio lip will be required to meet the stringent design requirements. It is shown that active boundary layer control is an effective means of preventing separation and that a significant reduction in inlet size can be achieved by removing only a small amount of bleed in the throat region of the inlet. A short, blowing-lip model was designed and fabricated. This model features an adjustable, blowing slot located near the hilite on the windward side of the inlet. T.M.

N82-22212# National Aerospace Lab., Tokyo (Japan). Noise and Emission Research Group.
AERODYNAMIC CHARACTERISTICS OF THE EXTERNAL USB POWERED LIFT SYSTEM USING SIDE FENCES FOR ENHANCEMENT OF COANDA FLOW ATTACHMENT
Masataka Maita, Hirotoshi Fujieda, and Shigemi Shindo Oct. 1981 20 p refs
(NAL-TR-686T; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

The fundamental aspects concerning the effect of side fences on powered lift augmentation for the external upper surface blowing (USB) propulsive-lift configuration, as ascertained by wind tunnel experiment, are presented. From the comparisons of aerodynamic performances made of configurations using side fences and of those using either vortex generators or using no special devices, it is concluded that the USB propulsive-lift concept using side fences for enhancement of engine exhaust flow attachment has promising potential for attaining very high and efficient powered lift performances. M.G.

N82-22213*# Bihrle Applied Research, Inc., Jericho, N. Y.
ANALYSIS OF ROTARY BALANCE DATA FOR THE F-15 AIRPLANE INCLUDING THE EFFECT OF CONFORMAL FUEL TANKS
Billy Barnhart Washington NASA Apr. 1982 71 p refs
(Contract NAS1-16205)
(NASA-CR-3479; NAS 1.26:3479) Avail: NTIS HC A04/MF A01 CSCL 01A

F-15 rotary balance data was analyzed, and the influence of control deflections, Reynolds number and airplane components, i.e., body, wing, horizontal and vertical tails, as well as conformal tanks, on the aerodynamics up to 90 degrees angle of attack are discussed. Steady state spin mode predictions using these data are presented, which show excellent correlation with spin tunnel and flight test results. Generally, the data shows damped yawing moment slopes with rotation at all angles of attack, and good control effectiveness. Differences in the rotary aerodynamics due to the addition of conformal tanks are minimal. The small differences in the region of the flat spin do, however, indicate that the resulting spin mode would be slightly flatter and faster for a conformal tank equipped airplane. The addition of conformal tanks make the airplane more departure susceptible. S.L.

N82-22217*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF NACELLES ON AERODYNAMIC CHARACTERISTICS OF AN EXECUTIVE-JET MODEL WITH SIMULATED, PARTIAL-CHORD, LAMINAR-FLOW-CONTROL WING GLOVE
Richard L. Campbell Apr. 1982 104 p refs
(NASA-TM-83271; L-14982; NAS 1.15:83271) Avail: NTIS HC A06/MF A01 CSCL 01A

Tests were conducted in the Langley High-Speed 7- by 10-Foot Tunnel using a 1/10-scale model of an executive jet to examine the effects of the nacelles on the wing pressures and model longitudinal aerodynamic characteristics. For the present investigation, each wing panel was modified with a

Various parameters (are ratio between injected and driven flows, Mach number, pressure and temperature ratios) are studied. The injector configuration also appears to be very important, in particular as to pressure fluctuations produced at injection and the corresponding aerodynamic noise in the wind tunnel. Author

N82-23171# West Virginia Univ., Morgantown. Coll. of Engineering.
UNSTEADY EJECTORS
Herman Viets *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 12 p refs

(Grant AF-AFOSR-0025-81)
Avail: NTIS HC A19/MF A01

Ejectors are examined by introducing a time dependency into the flow to increase the mixing rate and hence improve the performance of very short devices. Past studies of unsteady flows related to ejectors are reviewed and a device is proposed which has the potential to increase the mixing by means of both an unsteady flow and also acoustic interaction between the frequencies generated by the jet and the ejector shroud. Standing acoustic waves are identified in the ejector and, it is found that the short unsteady ejector performance is superior to that of a slot jet geometry. E.A.K.

N82-23172# Universite Scientifique et Medicale de Grenoble (France). Inst. de Mechanique.
IMPROVEMENT OF EJECTOR THRUST AUGMENTATION BY PULSATING OR FLAPPING JETS
G. Binder and H. Didelle *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 11 p refs Sponsored in part by Minstere de la Defense

Avail: NTIS HC A19/MF A01

The influence of pulsating or flapping motions forced on the primary jet on the performance of thrust augmenting ejectors was investigated. The effect of the frequency and the amplitude of the forced perturbations was determined for various mixing duct lengths and diffusor geometries. In constant area ejectors the improvement in thrust augmentation ratio over the performance obtained with a steady jet in the same geometry increases with decreasing duct length. Thrust augmentation further improved by the gain in diffusor pressure recovery produced by the unsteady jets. Maximum augmentations of 1.9 and 1.65 were obtained with pulsating and flapping jets respectively as compared to 1.35 and 1.5 in the steady case. These improvements in ejector performance are mainly due to the faster mixing produced by these jets. E.A.K.

N82-23173# Societe Bertin et Cie, Plaisir (France).
EXPERIMENTAL STUDY OF A JET DEFLECTOR [ETUDE EXPERIMENTALE D'UN DEVIATEUR DE JET]
M. Lepretre and C. Portier *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 20 p refs In FRENCH; ENGLISH summary Sponsored in part by Delegation Generale pour l'Armement
Avail: NTIS HC A19/MF A01

A provisional model of an aerodynamic device for orienting the thrust vector of a jet engine was set up by exploiting the reattachment properties of a sonic or slightly supersonic jet on a flat or curved deflector conveniently positioned downwards from the nozzle outlet. A parametric study shows that it would be possible to obtain important reverse rates without a drastic loss of the resultant thrust. Such a device can be of benefit in improving controllability during combat or in designing a STOL. The arrangement defined is characterized by great simplicity, the jet reattachment is spontaneous over all the explored area, and no extra systems are required for blowing or suction.
Transl. by A.R.H.

N82-23174# Alfa Romeo S.p.A., Naples (Italy).
TURBOPROP AND TURBOJET EJECTOR OPTIMISATION

V. P. Riviello, A. Murolo, and G. Torella (Italian Air Force Academy) *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 13 p refs
Avail: NTIS HC A19/MF A01

The off design performance of turboprop and turbojet engine with ejector exhaust ducts was investigated during the AR 318 turboprop engine development and certification program. The optimization of the matching between angle and exhaust duct system is developed. A theoretical approach is used by a synthesis program the appropriate numerical simulation of the ejector, both in the case of subsonic condition at the engine exhaust station and in a sonic station, with supersonic development of the flow through the ejector. To study the supersonic flow through the ejector a set of available experimental results is examinated to evaluate the reliability of theoretical methods for the secondary flow and for conditions. Hot condition experimental tests were performed and was compared with theoretical calculations. The next step concerns the installation of a suitable ejector system on the AR 180.10 turbojet engine, which is a derived version of the AR 318 turboprop. E.A.K.

N82-23179*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
V/STOL AIRCRAFT AND FLUID DYNAMIC
Leonard Roberts (Stanford Univ.) and Seth B. Anderson *In* AGARD Fluid Dyn. of Jets with Appl. to V/STOL Jan. 1982 5 p refs
Avail: NTIS HC A19/MF A01 CSCL 01A

The impact of military applications on rotorcraft and V/STOL aircraft design with respect to fixed wing aircraft is discussed. The influence of the mission needs on the configurational design of V/STOL aircraft, the implications regarding some problems in fluid dynamics relating to propulsive flows, and their interaction with the aircraft and the ground plane, are summarized. E.A.K.

N82-23183# Vereinigte Flugtechnische Werke-Fokker G.m.b.H., Bremen (West Germany).
INTEGRATED NAVIGATION-TF/TA-SYSTEM BASED ON STORED TERRAIN DATA PROCESSING
Horst-Dieter Lerche *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 13 p

Avail: NTIS HC A09/MF A01

A method to improve the reliability and optimization of terrain following flight is discussed. The terrain parameter comparison (TERPAC) system is described in which the main source of information is a terrain data base aboard the aircraft. The comparison is done in the position-fix-mode by matching the measured terrain signatures against terrain reference signatures stored in the mass memory. A hardware and software design of the combined navigation and terrain following/avoidance flight control system was developed and adapted to a modem avionic system architecture. M.G.

N82-23184# Societe d'Applications Generales d'Electricite et de Mecanique, Paris (France).
OPTIMAL INERTIAL NAVIGATION USING TERRAIN CORRELATION: AN ATTRACTIVE SOLUTION TO THE GROUND ATTACK AIRCRAFT NAVIGATION PROBLEM

L. Camberlein, M. deCremiers, and D. Chermette *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 15 p In FRENCH; ENGLISH summary

Avail: NTIS HC A09/MF A01

The use of terrain correlation for all-weather penetration and ground attack aircraft is discussed. Positioning by terrain correlation is briefly reviewed. For the ground attack aircraft application special algorithms allow large heading freedom over the updating area. The parameter sensitivity of the updating accuracy is analysed. This includes the terrain characteristics, the cartography accuracy, and the altitude measurement accuracy. The main operational features for ground attack aircraft are summarized: tri-dimensional updating; high accuracy facilitated by low altitude flight; self-contained, secure, jam-resistant, automated operation; a low level of heading constraint to and over the updating area; savings in weight, volume, electrical power and cost using sensors already needed on the aircraft. The principle of inertial system optimal updating is also briefly discussed. Temporal carryover from position and velocity updates can be crucial for accurate horizontal terrain following and weapon delivery initialization and in-flight alignment of tactical missiles. The possibility of integrating correlation and optimal filtering in the inertial unit is shown. A typical all weather ground attack mission scenario is described. This includes the extensive mission preparation, the nominal flight plan and possible alternatives, update area selection using ground based equipment and map data bases, and the data assembly and cassette loading. A possible operational systems architecture is described with the necessary equipment. M.G.

N82-23185# McDonnell Aircraft Co., St. Louis, Mo.
INTEGRATED FLIGHT AND FIRE CONTROL DEMONSTRATION ON AN F-15B AIRCRAFT: SYSTEM DEVELOPMENT AND GROUND TEST RESULTS
R. J. Landy, C. A. Scolatti, and J. F. Hunter (AFWAL) *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 17 p refs

Avail: NTIS HC A09/MF A01

An integrated flight and fire control (IFFC) system is described which utilizes an automatic coupler and modified flight control system to steer out tracking errors calculated by a director fire control system using information from an ATLIS 2 electro-optical tracker. The F-15B aircraft is the test bed aircraft. Simulation and analysis results indicate that the IFFC system has excellent air-to-air gunnery accuracy with decreased pilot workload. These results also indicate that attacker survivability in air-to-ground gunnery and bombing encounters can be increased by using maneuvering approaches without compromising air-to-ground weapon delivery accuracy. Extensive ground testing of IFFC hardware and software is described. Details of the flight test program plan are presented. M.G.

N82-23186# Singer Co., Wayne, N. J.
THE INTEGRATION OF MULTIPLE AVIONIC SENSORS AND TECHNOLOGIES FOR FUTURE MILITARY HELICOPTERS

Albert J. Shapiro *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 21 p refs

Avail: NTIS HC A09/MF A01

Multi-sensor navigation systems already available and in use in helicopters are discussed followed by a review of the system trade-offs and considerations leading to new systems that use more advanced digital electronic techniques to achieve the goals of reduced pilot workload, improved performance at minimum size, weight, and cost. The beneficial impact of ongoing technological advances in improving the operating capabilities of future avionics systems is indicated. R.J.F.

N82-23187# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Plans and Management Information Dept.
PRODUCTION VERIFICATION TESTING (PVT) OF GUIDANCE AND CONTROL SYSTEMS FOR HIGH RELIABILITY

Paul J. Logus *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 11 p refs

Avail: NTIS HC A09/MF A01

The testing of equipment for highly integrated guidance and control systems is addressed. A departure to the usual acceptance testing is discussed by examining in some detail a technique called production verification testing (PVT). Some of the recent literature and experience is reviewed. Computer simulation are used to examine various facets of PVT. Particular emphasis is directed toward the implementation of 100% testing of all systems prior to delivery through the use of N sequential failure-free cycles. Finally, conclusions drawn from computer simulations are presented. The number of N sequential failure free cycles that may be necessary is suggested, providing insight into interpreting the results. Simulation results suggest a means for determining not only expected operational reliability but also process control problems during manufacturing. R.J.F.

N82-23189# Systems Control, Inc., Palo Alto, Calif.
ANALYSIS OF COMPUTING SYSTEM CONFIGURATIONS FOR HIGHLY INTEGRATED GUIDANCE AND CONTROL SYSTEMS
J. Edwin Jones, Jay S. Karmarkar, and Randall E. Fleming *In* AGARD Guidance and Control Technol. for Highly Integrated Systems Feb. 1982 9 p refs

Avail: NTIS HC A09/MF A01

The importance of early and sustained validation of architectures for highly integrated systems is discussed. Two early validation tools are presented. A description of the two tools, (1) generalized reliability and maintainability program (GRAMP), and (2) functional emulation, is presented, along with a discussion of their utility in the development of highly integrated guidance and control systems. B.W.

N82-23192*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A FLIGHT INVESTIGATION OF BLADE-SECTION AERODYNAMICS FOR A HELICOPTER MAIN ROTOR HAVING RC-SC2 AIRFOIL SECTIONS
Charles E. K. Morris, Jr. Mar. 1982 163 p refs
(NASA-TM-83298; NAS 1.15:83298) Avail: NTIS HC A08/MF A01 CSCL 10A

Pressure data at 90 percent blade radius for a helicopter main rotor with RC-SC2 blade sections was obtained. Concurrent measurements were made of vehicle flight state, performance and some rotor loads. The test envelope included hover, level flight from about 65 to 144 knots, climb and descent, and collective fixed maneuvers. Airfoil pressure distributions obtained in flight agree with those theoretical calculations for two dimensional, steady flow. S.L.

N82-23193*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
APPLICATION OF A TRANSONIC POTENTIAL FLOW CODE TO THE STATIC AEROELASTIC ANALYSIS OF THREE-DIMENSIONAL WINGS
Woodrow Whitlow, Jr. and Robert M. Bennett Apr. 1982 12 p refs Presented at the AIAA/ASME/ASCE/AHS 23rd Struct., Structural Dyn. and Mater. Conf., New Orleans, 10-12 May 1982
(NASA-TM-83296; NAS 1.15:83296; AIAA-PAPER-82-0689) Avail: NTIS HC A02/MF A01 CSCL 01A

Since the aerodynamic theory is nonlinear, the method requires the coupling of two iterative processes - an aerodynamic analysis and a structural analysis. A full potential analysis code, FLO22, is combined with a linear structural analysis to yield aerodynamic load distributions on and deflections of elastic wings. This method was used to analyze an aeroelastically-scaled wind tunnel model of a proposed executive-jet transport wing and an aeroelastic research wing. The results are compared with the corresponding rigid-wing analyses, and some effects of elasticity on the aerodynamic loading are noted. T.M.

N82-23194*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN ACCURATE METHOD FOR EVALUATING THE KERNEL OF THE INTEGRAL EQUATION RELATING LIFT TO DOWNWASH IN UNSTEADY POTENTIAL FLOW
Robert N. Desmarais Apr. 1982 15 p refs Presented at the AIAA/ASME/ASCE/AHS 23rd Struct., Structural Dyn. and Mater. Conf., New Orleans, 10-12 May 1982 10-12 May 1982
(NASA-TM-83281; NAS 1.15:83281; AIAA-PAPER-82-687) Avail: NTIS HC A02/MF A01 CSCL 01A

The method is capable of generating approximations of arbitrary accuracy. It is based on approximating the algebraic part of the nonelementary integrals in the kernel by exponential functions and then integrating termwise. The exponent spacing in the approximation is a geometric sequence. The coefficients and exponent multiplier of the exponential approximation are computed by least squares so the method is completely automated. Exponential approximates generated in this manner are two orders of magnitude more accurate than the exponential approximation that is currently most often used for this purpose. The method can be used to generate approximations to attain any desired trade-off between accuracy and computing cost. T.M.

N82-23195*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC AND UNSTEADY PRESSURE MEASUREMENTS ON A 50 DEGREE CLIPPED DELTA WING AT M = 0.9
R. W. Hess, E. C. Wynne, and F. W. Cazier Apr. 1982 10 p refs
(NASA-TM-83297; NAS 1.15:83297) Avail: NTIS HC A02/MF A01 CSCL 01A

Pressures were measured with Freon as the test medium. Data taken at M = 0.9 is presented for static and oscillatory deflections of the trailing edge control surface and for the wing in pitch. Comparisons of the static measured data are made with results computed using the Bailey-Ballhaus small disturbance code. T.M.

N82-23196*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TIME-MARCHING TRANSONIC FLUTTER SOLUTIONS INCLUDING ANGLE-OF-ATTACK EFFECTS
John W. Edwards, Robert M. Bennett, Woodrow Whitlow, Jr., and David A. Seidel Apr. 1982 16 p refs Presented at the

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Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 247-255. 24 refs. Research supported by the University of Florida. (AIAA 82-0712)

This paper describes recent analytical and experimental efforts to determine the effects of fiber aspect ratio, fiber spacing, and the visco-elastic properties of constituent materials on the damping and stiffness of aligned discontinuous fiber reinforced polymer matrix composites. This includes the analysis of trade-offs between damping and stiffness as the above parameters are varied. Two different analytical models show that there is an optimum fiber aspect ratio for maximum damping, and that the predicted optimum aspect ratios lie in the range of actual aspect ratios for whiskers and microfibers. Experimental data for E-glass/epoxy specimens is presented for comparison with predictions. (Author)

A82-30107 # **Integrity analyses of surface-flawed aircraft attachment lugs - A new, inexpensive, 3-D alternating method.** T. Nishioka and S. N. Atluri (Georgia Institute of Technology, Atlanta, GA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 287-300. 24 refs. Grant No. AF-AFOSR-81-0057. (AIAA 82-0742)

A new alternating method for the analysis of a quarter-elliptical corner crack is developed. The completely general analytical solution for an embedded crack, in an infinite solid, subject to arbitrary crack-face tractions, is implemented in the present alternating method. The present finite element alternating method results in an inexpensive procedure for routine evaluation of accurate stress intensity factors for flawed structural components. The present alternating method is applied to the analyses of various shapes of quarter-elliptical corner cracks (1) in a brick subject to remote tension, (2) emanating from a hole in finite-thickness plates, subject to remote tension as well as bearing pressure, and (3) emanating from a pin hole in aircraft attachment lugs subject to simulated pin loading. The results for the problem (1) and (2) are compared with those available in literature. For the problem (3) the stress intensity factors, and their parametric variations for the corner cracks of various shapes are presented. (Author)

A82-30109 # **737 graphite-epoxy horizontal stabilizer certification.** J. E. McCarty, R. W. Johnson, and D. R. Wilson (Boeing Commercial Airplane Co., Seattle, WA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 307-322. 12 refs. (AIAA 82-0745)

The 737 graphite-epoxy horizontal stabilizer was developed as part of the NASA/ACEE Advanced Composite Structures Program, which was initiated in July 1977. Certification requirements were completed in February 1982. The 737 graphite-epoxy horizontal stabilizer, which represents a weight savings of 21.6 percent, will be the first major component of aircraft primary structure to be certified for commercial airline service. The approach taken to obtain certification is considered. This approach complies with FAA regulations while maintaining the philosophy that commercial aircraft structures are certified by structural analysis and supporting test evidence. G.R.

A82-30114 * # **Experimental stress analysis of a thin-walled pressurized torus loaded by contact with a plane.** D. E. Hill (Deere and Co., Moline, IL) and J. R. Baumgarten (Iowa State University of Science and Technology, Ames, IA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 369-373. 6 refs. Grant No. NsG-1605. (AIAA 82-0753)

It is pointed out that pneumatic tires have a large effect on the overall landing characteristics of an aircraft. The dynamic response upon landing and steering are crucial to the safety of the vehicle and the occupants. The present investigation has the objective to compare experimentally determined strains on an inner tube in contact with a flat plate with numerical values obtained on the basis of a finite element prediction, taking into account an employment of the Structural Analysis of General Shells (STAGS). The obtained results suggest that the clamped boundary condition utilized in the STAGS calculation is not exactly simulated by the employed test setup. G.R.

A82-30116 # **Flight qualification of composite structures at AMD-BA.** D. Chaumette (Avions Marcel Dassault-Breguet Aviation, Saint-Cloud, Hauts-de-Seine, France). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 381-390. (AIAA 82-0755)

A brief description is provided of the different programs conducted in a French aerospace company, taking into account composite materials employed in the Mirage III rudder, the Mirage F1 horizontal stabilizer, the Mir F1 aileron, the Falcon 50 aileron, and the fin, the rudder, and the elevons of the Mirage 2000. Attention is also given to the introduction of a very new technology in connection with the development of the Super-Mirage 4000, an experimental Alpha Jet empennage, and the Falcon 10 wing. The design of the Falcon 10 wing utilizes integrally stiffened carbon-fiber panels. G.R.

A82-30117 # **On the characterization of damages in graphite-epoxy composites.** S. V. Hanagud and R. G. Clinton, Jr. (Georgia Institute of Technology, Atlanta, GA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 391-404. 39 refs. (AIAA 82-0757)

Flaws are created in graphite-epoxy composites when they are exposed to an environment of high moisture and elevated temperature. The possibility of nondestructively identifying these flawed states and quantitatively estimating the flaws have been attempted by the measurement and analysis of acoustic emission events, counts per events and amplitude distribution. In particular cross ply woven composite laminates have been studied in undamaged and damaged states. Techniques and methods of standardizing the test procedures have also been discussed. (Author)

A82-30118 * # **Environmental and high strain rate effects on composites for engine applications.** C. C. Chamis and G. T. Smith (NASA, Lewis Research Center, Cleveland, OH). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 405-419. 9 refs. (AIAA 82-0758)

The complex environmental and loading conditions experienced by many turbine engine components impose severe durability and damage tolerance requirements for component materials. Programs are being conducted to establish the structural performance of composite materials under anticipated engine operating environments. A description is presented of the results obtained in connection with several of these programs. A comparison of predicted and measured hygrothermal effects is considered along with hygrothermal effects on defect growth, high strain rate effects on composite mechanical properties, dynamic stress intensity factors for composites, and the indentation laws for composite impact analysis. G.R.

A82-30119 # **A computerized system for the application of fracture tracking data to aircraft management for the C-5A military airlift transport.** D. V. Finkle and J. S. Wilson (Lockheed-Georgia Co., Marietta, GA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 429-434. USAF-supported research. (AIAA 82-0760)

The Aircraft Operational Suitability Program (AOSP) is a computerized system which provides the United States Air Force a means by which to assess the impact of day-to-day aircraft operations on structural inspection schedules and structural life reserve hours for the C-5A. The AOSP uses data generated by the C-5A individual aircraft fracture tracking system and features operations via remote computer terminal hookups. Specific operations of the AOSP include evaluations of the relative severity of proposed missions and the impact of proposed missions on established structural inspection and modification schedules. (Author)

A82-30125 # **High temperature, short term tensile strength of C6000/PMR-15 graphite polyimide.** P. R. DiGiovanni and D. Paterson (Raytheon Co., Missile Systems Div., Bedford, MA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, 1982, p. 487-492. 5 refs. (AIAA 82-0711)

Tensile tests were conducted on 0 deg unidirectionally reinforced Celion 6000 graphite fibers in PMR 15 polyimide matrix. Tensile strengths for coupons subjected to short and long term uniform temperatures were obtained. Thick coupons, heated on one side to produce significant transient through thickness temperature gradients, were tested and compared to the strength of specimens with uniform temperature distributions. All coupons were radiantly heated and reached maximum test temperatures within 15 sec. Tensile loads were applied to the coupons after 15 sec of elevated temperature exposure. Loading rates were selected so that specimen failures occurred within a maximum of 45 sec after reaching the test temperature. Results indicate that significant tensile strength remains beyond the material post cure temperature. (Author)

A82-30137 # **An automated technique for improving modal test/analysis correlation.** D. T. Grossman (McDonnell Aircraft Co., St. Louis, MO). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 68-76. 7 refs. (AIAA 82-0640)

An automated technique for adjusting individual mass and stiffness elements to improve the correlation of analytical frequency and mode shape data with ground vibration test results is described. Perturbation formulae are used to calculate derivatives of a 'correlation coefficient' representing the overall similarity of the analytical and experimental results. A special iterative routine is developed to maximize this quantity and thus improve the overall correlation. The technique allows the user to take advantage of engineering judgment, produces physically realizable answers, and does not require the starting values of the variables to be near the final answers. Sample results are given. (Author)

A82-30138 # **Pressure measurements on twin vertical tails in buffeting flow.** W. E. Triplett (McDonnell Aircraft Co., St. Louis, MO). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 77-83. USAF-sponsored research. (AIAA 82-0641)

Buffeting pressures were measured on the vertical tail surfaces of a 13 percent F-15 model in a low-speed wind tunnel. Test variables included dynamic pressure, aircraft angle-of-attack, vertical tail incidence and rudder deflection. Pressure transducers were flush mounted on rigid and flexible tails. Steady and unsteady pressures were obtained from the transducers at levels as low as 0.1 percent full scale. The steady pressures were integrated for aerodynamic coefficients and the unsteady pressures were reduced to spectral densities. The pressures are maximum at approximately 22 deg angle-of-attack and are significantly affected by tail flexibility. (Author)

A82-30139 # **A wind-tunnel study of the aerodynamic characteristics of a slotted versus smooth-skin supercritical wing.** W. F. Grosser (Lockheed-Georgia Co., Marietta, GA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 84-93. (AIAA 82-0642)

Wind-tunnel research test data indicate that flutter characteristics at transonic speeds may be different for each supercritical airfoil configuration. Therefore, high-speed flutter testing for limited structural parameters may be inadequate. Models with sectionalized airfoils provide an economical construction method for easily varying important flutter parameters, while testing smooth-skin models is an expensive and difficult way to conduct parametric studies. A wind-tunnel test was performed to evaluate the effects of sectionalized model construction on aerodynamic behavior in the transonic speed range. The results indicate that sectionalized airfoils may not significantly affect supercritical flutter aerodynamics. (Author)

A82-30140 * # **Evaluation of four subcritical response methods for on-line prediction of flutter onset in wind-tunnel tests.** C. L. Ruhlin, J. J. Watson, R. H. Ricketts, and R. V. Doggett, Jr. (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 94-101. 7 refs. (AIAA 82-0644)

Four subcritical response methods were evaluated for on-line use in transonic wind-tunnel tests where the flutter model is excited solely by airstream turbulence. The methods were: randomdec, power-spectral-density, peak-hold, and cross-spectrum. Subcritical response data were obtained during tests in the Langley Transonic Dynamics Tunnel of a cantilevered flutter model wing. The test procedure was to maintain a constant Mach number and increase the dynamic pressure (q) in incremental steps. The four methods provided damping trends by which the flutter mode could be tracked and extrapolated to a flutter-onset q. A hard flutter point was obtained at M = 0.82. The peak-mold and cross-spectrum methods gave reliable results and could be most readily used for on-line testing. (Author)

A82-30141 # **Test demonstration of digital control of wing/store flutter.** E. H. Johnson, C. Hwang, W. S. Pi, D. F. Kesler, D. S. Joshi (Northrop Corp., Aircraft Div., Hawthorne, CA), and C. A. Harvey (Honeywell, Inc., Minneapolis, MN). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 102-110. 8 refs. Contract No. F33615-80-C-3217. (AIAA 82-0645)

Methods of digital control have been applied to the demonstration of the suppression of wing/store flutter. Digital control laws were developed by applying a modified Jordan canonical transformation to a state variable formulation of a control law synthesized originally for an analog system. After performing a real time simulation of the digital control system at Northrop's Hawthorne facilities, the system was tested in the Transonic Dynamics Tunnel at the NASA Langley Research Center. The results of the test showed that the performance of the digital controller was comparable to that of analog controllers. Attention during the test was focused on the insertion of adequate antialiasing filters, the effects of sample time and on the compensation for phase lags introduced by the digital control process. (Author)

A82-30142 # **Flutter of forward swept wings, analyses and tests.** T. A. Weisshaar, T. A. Zeiler (Purdue University, West Lafayette, IN), T. J. Hertz, and M. H. Shirk (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 111-121. 20 refs. (AIAA 82-0646)

The forward swept wing bndy-freedom flutter phenomenon and the Flight Dynamics Laboratory test program to investigate this phenomenon are discussed. Subsonic wind tunnel flutter tests of a variable sweep, forward swept wing model incorporating the rigid body fuselage pitch degree of freedom are conducted, and results illustrate the effects of flutter speed of static margin, wing sweep and composite wing stiffness. The phenomenon occurs well below the fixed root wing divergence speed, and the primary cause of instability is found to be a coupling between the short period and the wing fundamental bending mode. At the onset of body freedom flutter, significant amounts of pitch, plunge and bending motion are present in the aeroelastic and flight mechanics modes. Both decreasing aircraft static margin and decreasing the streamwise angle of attack in the fundamental wing bending mode tend to increase the body-freedom flutter speed. D.L.G.

simulated, partial-chord, laminar-flow-control glove. Horizontal-tail effects were also briefly examined. The tests covered a range of Mach numbers from 0.40 to 0.82 and lift coefficients from 0.20 to 0.55. Oil-flow photographs of the wing at selected conditions are included. Author

N82-22223# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Entwurfsaerodynamik.

DRAG REDUCTION USING PNEUMATIC TURBULATORS

Karl-Heinz Horstmann and Armin Quast Sep. 1981 54 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-743)
(DFVLR-FB-81-33) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 11,40

Reduction of the additional drag, caused by laminar separation bubbles in airfoils and fuselages at Reynolds numbers below 5 million, was investigated theoretically and experimentally. By blowing from a row of holes located at the separation line, the laminar bubble is destroyed and drag is reduced considerably. Drag reduction due to blowing is naturally smaller at lower Reynolds numbers, the bubbles being smaller. The Reynolds number range with low section drag increases if pneumatic turbulators are used in the profile design. Author (ESA)

N82-22224# National Aerospace Lab., Amsterdam (Netherlands). Flight Dynamics Div.

AEROELASTIC PROPERTIES OF WINGS IN TRANSONIC FLOW

R. J. Zwaan 24 Feb. 1981 51 p refs Presented at Lecture Ser. on Unsteady Airloads and Aeroelastic Probl. in Separated and Transonic Flow, Rhode-St.-Genese, Belgium, 9-13 Mar. 1981
(NLR-MP-81005-U) Avail: NTIS HC A04/MF A01

Literature on transonic flutter characteristics of wings, especially the transonic dip phenomenon in the flutter boundaries, was reviewed. The transonic dip occurs most distinctly with sweptback wings. The dip is caused by the phase lag of the lift due to the fundamental wing bending mode and corresponds to a single-mode flutter mechanism. The dip can be predicted qualitatively using methods for inviscid transonic unsteady air loads. Quasi-steady transonic methods are not wholly reliable. The dip becomes relatively deeper with increasing wing-to-air mass ratio. The dip can become more pronounced for a supercritical wing than for a conventional wing. The dip occurs at design conditions as well as off-design conditions. In case of flow separation, a narrow dip which depends strongly on boundary layer conditions and the spatial distribution of the separated flow can occur. Author (ESA)

N82-22225# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.

AEROSPATIALE SURVEY OF WIND TUNNEL TESTING OF SMALL AND LARGE SCALE ROTORS

J. P. Silvani and A. Vuillet Paris 1981 17 p refs Presented at the 7th European Rotocraft And Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-107) Avail: NTIS HC A02/MF A01

Wind tunnel tests on Mach scaled rotors (1/10 and 1/3) capable of a wide range of shaft angle settings are summarized. The 1/3 model hub is fitted with a swashplate, general and cyclic inputs. Continuous conversion of a tilt rotor was achieved. Speeds > 500 km/hr were attained with conventional rotors. During autorotation high lift coefficients are obtained without major drag penalties. The OA family 2-D airfoils characteristic improvements were checked. Results show good behaviour throughout the entire rotor flight envelope; a 3% improvement on the rotor figure of merit at nominal thrust in hover; a 9% power improvement at nominal thrust and 300 km/hr in level fight; and 12% maximum thrust improvement at stall. Author (ESA)

N82-22227*# Douglas Aircraft Co., Inc., Long Beach, Calif.

TRANSPORT AIRCRAFT ACCIDENT DYNAMICS Final Technical Report, 11 Feb. 1980 - Mar. 1982

A. Cominsky Atlantic City FAA Mar. 1982 178 p
(Contract NAS1-16111)
(NASA-CR-165850; FAA-RD-74-12; NAS 1.26:165850) Avail: NTIS HC A09/MF A01 CSCL 01C

A study was carried out of 112 impact survivable jet transport aircraft accidents (world wide) of 27,700 kg (60,000 lb.) aircraft and up extending over the last 20 years. This study centered on the effect of impact and the follow-on events on aircraft structures and was confined to the approach, landing and takeoff segments of the flight. The significant characteristics, frequency of occurrence and the effect on the occupants of the above data base were studied and categorized with a view to establishing typical impact scenarios for use as a basis of verifying the effectiveness of potential safety concepts. Studies were also carried out of related subjects such as: (1) assessment of advanced materials; (2) human tolerance to impact; (3) merit functions for safety concepts; and (4) impact analysis and test methods. Author

N82-22228*# Boeing Aerospace Co., Houston, Tex.

A SYSTEM SAFETY MODEL FOR DEVELOPMENTAL AIRCRAFT PROGRAMS

Emil J. Amberboy and Robert L. Stokeld Washington NASA Apr. 1982 84 p refs
(Contract NAS2-10361)
(NASA-CR-3534; NAS 1.26:3534) Avail: NTIS HC A05/MF A01 CSCL 01C

Basic tenets of safety as applied to developmental aircraft programs are presented. The integration of safety into the project management aspects of planning, organizing, directing and controlling is illustrated by examples. The basis for project management use of safety and the relationship of these management functions to 'real-world' situations is presented. The rationale which led to the safety-related project decision and the lessons learned as they may apply to future projects are presented. N.W.

N82-22229# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany). Abteilung Flugverkehrswissenschaft.

DEVELOPMENTAL POSSIBILITIES AND RESTRICTIONS IN AIR TRANSPORT

Aug. 1981 91 p In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-744)
(DFVLR-Mitt-81-9) Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 16,20

The possibilities of creating or maintaining an efficient air transport system in the present political, economical and technical situation were assessed. Future developments in demand and supply in commercial air transport and questions related to transport policy, airport planning and supply organization of air carriers are discussed.

N82-22230# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany). Abteilung Flugverkehrswissenschaft.

DEVELOPMENTAL POSSIBILITIES IN CIVIL AVIATION IN THE FEDERAL REPUBLIC OF GERMANY [ENTWICKLONGSMOEGLICHKEITEN IM GEWERBLICHEN LUFTVERKEHR DER BUNDESREPUBLIK DEUTSCHLAND]

H.-G. Nuesser *In its* Develop. Possibilities and Restrictions in Air Transport Aug. 1981 p 11-46 In GERMAN

Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 16,20

The results of a prognosis was made on the evolution of air traffic until the year 2000 in Germany. Travel motives, flight type, region, season and traffic paths are forecasted. Data are used to derive the required evolution in the supply of passenger and cargo flights. The forecast includes a 5% annual increase in passenger traffic, reaching in the year 2000 a total number of some 765,000 starts and take offs at a seating capacity of about 60%. Forecasts for individual airports are also included. Author (ESA)

N82-22232# Flughafen G.m.b.H., Hamburg (West Germany).

TRAFFIC INTRASTRUCTURE: CAN PLANNING STILL BE CARRIED THROUGH [VERKEHRSINFRASTRUKTUR: IST PLANUNG NOCH DURCHSTEZBAR?]

U. Christiansen *In* DFVLR Develop. Possibilities and Restrictions in Air Transport Aug. 1981 p 61-66 In GERMAN

Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 16,20

The problems facing German airport authorities in planning either to extend existing, or to create new airports are analyzed. In addition to the growing environmental awareness by the public, the procedures for approval at various administrative and juridical

levels are identified as the major reason for the considerable delays encountered in recent projects. Several proposals are formulated for simplification and shortening these procedures.
Author (ESA)

N82-22236# National Transportation Safety Board, Washington, D. C.
SPECIAL INVESTIGATION REPORT: EVACUATION OF UNITED AIRLINES DC-8-61, SKY HARBOR INTERNATIONAL AIRPORT, PHOENIX, ARIZONA, DECEMBER 29, 1980
9 Sep. 1981 29 p refs
(PB82-115619; NTSB-SIR-81-4) Avail: NTIS HC A03/MF A01 CSCL 01B

On December 29, 1980, United Airlines Charter Flight 5820, a DC-8-61, with 238 passengers and a crew of 9, was evacuated at Sky Harbor International Airport, Phoenix, Arizona, when the failure of the rear landing gear bogie beam resulted in a fire in the aircraft's right main landing gear. The cockpit crew was erroneously advised of an engine fire by the airport tower and began emergency shutdown procedures. The captain initiated the evacuation after all electrical power had been shut down and the public address and cabin interphone systems were without power. Therefore, the second officer had to give the evacuation orders to passengers and flight attendants by 'word of mouth'. As a result of its special investigation and its previous work on the subject of evacuations, the Safety Board has made recommendations to the Federal Aviation Administration to improve the availability of emergency communication equipment and to promote its use.
GRA

N82-22237# National Transportation Safety Board, Washington, D. C.
REVIEW OF ROTORCRAFT ACCIDENTS 1977-1979
11 Aug. 1981 59 p
(PB82-115601; NTSB-AAS-81-1) Avail: NTIS HC A04/MF A01 CSCL 01B

Accident data on the rotorcraft, pilots and operating environment which may be most useful to designers, manufacturers, operators and regulators are presented. Tables and graphs presenting accident statistics, cause/factors, rotorcraft make and model data, pilot experience and weather conditions are included.
GRA

N82-22238*# Ohio State Univ., Columbus.
A TACTUAL DISPLAY AID FOR PRIMARY FLIGHT TRAINING Final Report, 1 Jul. 1976 - 15 Dec. 1978
Richard D. Gilson Jul. 1979 76 p refs
(Contract NAS2-8954)
(NASA-CR-166242; NAS 1.26:166242) Avail: NTIS HC A05/MF A01 CSCL 01D

A means of flight instruction is discussed. In addition to verbal assistance, control feedback was continously presented via a nonvisual means utilizing touch. A kinesthetic-tactile (KT) display was used as a readout and tracking device for a computer generated signal of desired angle of attack during the approach and landing. Airspeed and glide path information was presented via KT or visual heads up display techniques. Performance with the heads up display of pitch information was shown to be significantly better than performance with the KT pitch display. Testing without the displays showed that novice pilots who had received tactile pitch error information performed both pitch and throttle control tasks significantly better then those who had received the same information from the visual heads up display of pitch during the test series of approaches to landing. Author

N82-22239*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF CABLE GEOMETRY AND AIRCRAFT ATTITUDE ON THE ACCURACY OF A MAGNETIC LEADER CABLE SYSTEM FOR AIRCRAFT GUIDANCE DURING ROLLOUT AND TURNOFF
W. Thomas Bundick Apr. 1982 32 p refs
(NASA-TP-1978; L-14975; NAS 1.60:1978) Avail: NTIS HC A03/MF A01 CSCL 17G

A theoretical analysis of a single wire magnetic leader cable system for aircraft rollout and turnoff guidance was performed to determine the errors produced by the leader cable installation geometry and aircraft attitude. It was found that errors in the measurement of lateral displacement from the cable are smaller than errors in the measurement of aircraft heading and that both errors are smallest at or near the cable. Author

N82-22240*# California Univ., Berkeley. Inst. of Transportation Studies.
MEASURES TO INCREASE AIRFIELD CAPACITY BY CHANGING AIRCRAFT RUNWAY OCCUPANCY CHARACTERISTICS
Geoffrey D. Gosling, Abid Kanafani, and Stephen L. M. Rockaday Dec. 1981 218 p refs
(Grant NAG2-19)
(NASA-CR-168841; NAS 1.26:168841; UCB-ITS-RR-81-7) Avail: NTIS HC A10/MF A01 CSCL 17G

Airfield capacity and aircraft runway occupancy characteristics were studied. Factors that caused runway congestion and airfield crowding were identified. Several innovations designed to alleviate the congestion are discussed. Integrated landing management, the concept that the operation of the final approach and runway should be considered in concert, was identified as underlying all of the innovations.
R.J.F.

N82-22241# Aeronautical Research Labs., Melbourne (Australia).
STRAPDOWN INERTIAL NAVIGATION SYSTEMS: AN ALGORITHM FOR ATTITUDE AND NAVIGATION COMPUTATIONS
R. B. Miller 1981 33 p refs
(ARL/Sys-Rept-23; AR-002-265) Avail: NTIS HC A03/MF A01

Vehicle attitude is maintained through quaternions, which are updated by a modified third order method. The navigation part of the algorithm uses a split frame technique whereby body related quantities are evaluated in body axis coordinates, and navigation frame related quantities are evaluated in navigation axis coordinates. The algorithm is partitioned into three sections which are performed at different rates according to the application.
T.M.

N82-22242# Royal Aircraft Establishment, Farnborough (England).
AIRFIELD VISUAL AIDS RESEARCH AT THE ROYAL AIRCRAFT ESTABLISHMENT
A. J. Smith 2 Oct. 1981 29 p refs Presented at the 1981 Aviation Lighting Sen., Williamsburg, Virginia, 9-13 Nov. 1981; Sponsored by Illuminating Engineering Society of North America
(RAE-TM-FS-431; BR80893) Avail: NTIS HC A03/MF A01

The precision approach path indicator (PAPI) is described and helicopter lighting aids are discussed. The PAPI system indicates correct glide slope at ranges > 10 km under good visibility conditions and provides information up to 300 m from touchdown. Two color light projector units, consisting of three simple optical projectors side by side in a box, tell the pilot if he is too high, too low, or on slope by the combination of red and white lights. Trials show that it can be used by a wide range of civil and military aircraft, e.g., the VC-10, small private airplanes, or helicopters. A mathematical model which predicts what pilots can see when landing in fog was used in order to optimize proposed approach lighting patterns for helicopters. If the lighting pattern is 730 m long, initial contact is possible at altitudes > 100 m. Lighting trials show that red stop bar lighting and green taxiway centerline need further improvement.
Author (ESA)

N82-22243*# Aeronautical Research Associates of Princeton, Inc., N. J.
ANALYSIS AND FLIGHT EVALUATION OF A SMALL, FIXED-WING AIRCRAFT EQUIPPED WITH HINGED PLATE SPOILERS
John W. Olcott, Edward Seckel, and David R. Ellis Sep. 1981 161 p refs
(Contract NAS2-6589)
(NASA-CR-166247; NAS 1.26:166247) Avail: NTIS HC A08/MF A01 CSCL 01C

The results of a four phase effort to evaluate the application of hinged plate spoilers/dive brakes to a small general aviation aircraft are presented. The test vehicle was a single engine light aircraft modified with an experimental set of upper surface spoilers and lower surface dive brakes similar to the type used on sailplanes. The lift, drag, stick free stability, trim, and dynamic response characteristics of four different spoiler/dive brake configurations were determined. Tests also were conducted, under a wide range of flight conditions and with pilots of various experience levels, to determine the most favorable methods of spoiler control and to evaluate how spoilers might best be used

AIAA/ASME/ASCE/AHS Struct., Structural Dyn. and Mater. Conf., New Orleans, 10-12 May 1982
(NASA-TM-83295; NAS 1.15:83295; AIAA-PAPER-82-0685)
Avail: NTIS HC A02/MF A01 CSCL 01A

Transonic aeroelastic solutions based upon the transonic small perturbation potential equation were studied. Time-marching transient solutions of plunging and pitching airfoils were analyzed using a complex exponential modal identification technique, and seven alternative integration techniques for the structural equations were evaluated. The HYTRAN2 code was used to determine transonic flutter boundaries versus Mach number and angle-of-attack for NACA 64A010 and MBB A-3 airfoils. In the code, a monotone differencing method, which eliminates leading edge expansion shocks, is used to solve the potential equation. When the effect of static pitching moment upon the angle-of-attack is included, the MBB A-3 airfoil can have multiple flutter speeds at a given Mach number. T.M.

N82-23197# Aeronautical Research Labs., Melbourne (Australia).
A NUMERICAL INVESTIGATION OF TWO-DIMENSIONAL, SUBSONIC, LINEAR, WIND TUNNEL INTERFERENCE THEORY
N. Pollock Jun. 1981 40 p refs
(ARL/AERO-NOTE-403; AR-002-294) Avail: NTIS HC A03/MF A01

An investigation of two-dimensional, subsonic, linear wind tunnel interference using the computer program TSFOIL as a numerical tunnel was carried out for solid, open, porous and slotted walls. The use of a computer code rather than physical experiment has the advantage that test parameters such as wall characteristics and model chord can be varied widely at low cost. The aim was to determine the relative merits of the various walls and to establish the limits of applicability of linear interference theory. The most favorable wall type was found to be an ideal slotted wall with the slot parameter appropriate for zero solid blockage (F = 1.1844). For this wall type linear interference theory accurately predicted lift and pitching moment corrections for tunnel height to chord ratios greater than 2 and supersonic region height to tunnel height ratios less than 0.2. Author

N82-23198# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Aeroelastik.
UNSTEADY PRESSURE MEASUREMENTS AT STALL AND BUFFETING
Peter Bublitz Apr. 1979 52 p refs In GERMAN; ENGLISH summary Translation was announced as N81-21041
(DFVLR-Mitt-79-09) Avail: NTIS HC A04/MF A01

The fluid dynamic phenomena of stall and buffeting, as well as the marked effects on elastic structures are described. By applying the generalized form of the equations of motion and the Fourier transforms, the governing equation of the dynamic response problem is concisely derived. Quantities needed to treat the problem under consideration are determined. Then the test installation and the relevant test method are depicted to some extent, in which the direct pressure measuring method and the statistical evaluation method are the main topics. A trapezoidal stalled wing with and without strake are tested. The efficiency of the test procedure is shown and some insight into the dynamic behavior of the stall is provided. S.L.

N82-23199# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
APPROXIMATE METHOD FOR PREDICTING SUPERSONIC NORMAL FORCE COEFFICIENT VERY-LOW-ASPECT-RATIO LIFTING SURFACES
E. F. Lucero 14 May 1981 32 p refs Sponsored in part by NAVSEA 62R
(AD-A111770) Avail: NTIS HC A03/MF A01 CSCL 20/4

A simple, empirical method has been developed for predicting at supersonic speeds the normal force coefficient, C(N), (including carryover) of very-low-aspect ratio lifting surfaces mounted on bodies of revolution. Predicted values of C(N) using this method are shown to be in good agreement with test data obtained on both thick and thin surfaces, at Mach numbers from about 2.5 to 7.7 and angles of attack to 24 degrees. Author (GRA)

N82-23200# Akademische Fliegergruppe Braunschweig (West Germany).
WIND TUNNEL INVESTIGATIONS OF SAILPLANE FUSELAGES WITH DIFFERENT LACINGS AND WING SETTINGS [WINDKANALUNTERSUCHUNGEN AN SEGELFLUGZEUG-RUEMPFEN MIT VERSCHIEDENER EINSCHNUERUNG UND FLUEGELANORDNUNG]
Rolf Radespiel 1981 14 p In GERMAN
Avail: NTIS HC A02/MF A01

The parameter fuselage lacing, sailplane wing setting and fuselage nose radius of nine glider configurations were investigated in a wind tunnel. Laminar peeling off blisters were found on strongly laced fuselages. These in the transition between fuselage and wing are essential for the harmful aerodynamic resistance. Resistance reduction was measured for increasing lacing and wing setting in the rear. These results are only valid for undisturbed flow on the fuselage front part, a condition which is not yet fulfilled for original sailplanes. Author (ESA)

N82-23207*# Boeing Commercial Airplane Co., Seattle, Wash.
COMMERCIAL JET TRANSPORT CRASHWORTHINESS
E. Widmayer and Otto B. Brende Apr. 1982 255 p refs
(Contract NAS1-16076)
(NASA-CR-165849; NAS 1.26:165849; DOT-FAA-CT-82-86)
Avail: NTIS HC A12/MF A01 CSCL 01C

The results of a study to identify areas of research and approaches that may result in improved occupant survivability and crashworthiness of transport aircraft are given. The study defines areas of structural crashworthiness for transport aircraft which might form the basis for a research program. A 10-year research and development program to improve the structural impact resistance of general aviation and commercial jet transport aircraft is planned. As part of this program parallel studies were conducted to review the accident experience of commercial transport aircraft, assess the accident performance of structural components and the status of impact resistance technology, and recommend areas of research and development for that 10-year plan. The results of that study are also given. R.J.F.

N82-23208*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HELICOPTER HANDLING QUALITIES
Apr. 1982 243 p refs Proceedings of the special meeting held at Moffett Field, Calif., 14-15 Apr. 1982; sponsored by the American Helicopter Society
(NASA-CP-2219; A-8891; NAS 1.55:2219) Avail: NTIS HC A11/MF A01 CSCL 01C

Helicopters are used by the military and civilian communities for a variety of tasks and must be capable of operating in poor weather conditions and at night. Accompanying extended helicopter operations is a significant increase in pilot workload and a need for better handling qualities. An overview of the status and problems in the development and specification of helicopter handling-qualities criteria is presented. Topics for future research efforts by government and industry are highlighted.

N82-23209*# Naval Air Development Center, Warminster, Pa.
VTOL AND VSTOL HANDLING QUALITIES SPECIFICATIONS, AN OVERVIEW OF THE CURRENT STATUS
Kevin W. Goldstein *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 1-7 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

The highlights of a comparative analysis between the current helicopter and VSTOL specifications and four representative rotary wing aircraft are presented. Longitudinal, lateral, and directional control power and dynamic stability characteristics were analyzed for hovering conditions. Forward flight static and dynamic stability were analyzed for the longitudinal and lateral-directional axes. Results of the analyses in terms of the applicability/utility of the MIL-H-8501A criteria are presented for each of the above areas. The review of the MIL-H-8301A criteria against those in MIL-F-83300 and AGARD 577 indicate many areas in which MIL-H-8501A does not give adequate design guidance. T.M.

N82-23210*# Aerospatiale Helicopter Corp., Grand Prairie, Tex.
CIVIL (FRENCH/US) CERTIFICATION OF THE COAST GUARD'S HH-65A DAUPHIN
J. C. Hart, J. M. Besse (Societe Nationale Industrielle Aerospatiale, Marignane, France), and K. W. McElreath (Rockwell Collins Government Avionics Div., Cedar Rapids, Iowa) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p

9-13
Avail: NTIS HC A11/MF A01 CSCL 01C

Certification programs with particular emphasis on handling qualities requirements are described. A dynamic simulator was designed and constructed to support and verify the dynamic aspects of the avionics system, particularly the Automatic Flight Control System (AFCS). The role of the Dynamic Simulator is discussed. T.M.

N82-23211*# Boeing Vertol Co., Philadelphia, Pa.
BOEING 234 FLIGHT CONTROL DEVELOPMENT
James J. Morris *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 15-22

Avail: NTIS HC A11/MF A01 CSCL 01C

The Boeing 234 is the commercially certified derivative of the CH-47 Chinook. The automatic flight control system and flight director with coupler were designed to reduce pilot work-load for missions of approximately six hour duration during VFR, IFR, day and night conditions. The AFCS system for the 234 is essentially the same system as developed for the CH-47D, which has airspeed hold, attitude hold, and maneuver enhancement in all three axes. The system also has the capability to couple to the Sperry Helcis flight director system which provides for enroute navigation and landing approaches. Certification testing was completed, by both the FAA and CAA, to FAR Part 29 for Transport Category Rotorcraft and BCAR Section G: Rotorcraft. The aircraft was certified for civil operation in June 1981. Author

N82-23212*# Grumman Aerospace Corp., Bethpage, N.Y.
INFLUENCE OF MANEUVERABILITY ON HELICOPTER COMBAT EFFECTIVENESS
Michael Falco and Roger Smith (Army Aviation Research and Development Command, St. Louis, Mo.) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 23-33 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

A computational procedure employing a stochastic learning method in conjunction with dynamic simulation of helicopter flight and weapon system operation was used to derive helicopter maneuvering strategies. The derived strategies maximize either survival or kill probability and are in the form of a feedback control based upon threat visual or warning system cues. Maneuverability parameters implicit in the strategy development include maximum longitudinal acceleration and deceleration, maximum sustained and transient load factor turn rate at forward speed, and maximum pedal turn rate and lateral acceleration at hover. Results are presented in terms of probability of skill for all combat initial conditions for two threat categories. T.M.

N82-23213*# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugmechanik.
FLIGHT TESTS FOR THE ASSESSMENT OF TASK PERFORMANCE AND CONTROL ACTIVITY
Heinz-Juergen Pausder and Dieter Hummes *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 35-46 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

The tests were performed with the helicopters BO 105 and UH-1D. Closely connected with tactical demands the six test pilots' task was to minimize the time and the altitude over the obstacles. The data reduction yields statistical evaluation parameters describing the control activity of the pilots and the achieved task performance. The results are shown in form of evaluation diagrams. Additionally dolphin tests with varied control strategy were performed to get more insight into the influence of control techniques. From these test results recommendations can be derived to emphasize the direct force control and to reduce the collective to pitch crosscoupling for the dolphin. T.M.

N82-23214*# Army Research and Technology Labs., Moffett Field, Calif.
A HELICOPTER HANDLING-QUALITIES STUDY OF THE EFFECTS OF ENGINE RESPONSE CHARACTERISTICS, HEIGHT-CONTROL DYNAMICS, AND EXCESS POWER ON NAP-OF-THE-EARTH OPERATIONS
Lloyd D. Corliss *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 47-57 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

The helicopter configuration with an rpm-governed gas-turbine engine was examined. A wide range of engine response time, vehicle damping and sensitivity, and excess power levels was studied. The data are compared with the existing handling-qualities specifications, MIL-F-83300 and AGARD 577, and in general show a need for higher minimums when performing such NOE maneuvers as a dolphin and bob-up task. T.M.

N82-23215*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
UNIFIED RESULTS OF SEVERAL ANALYTICAL AND EXPERIMENTAL STUDIES OF HELICOPTER HANDLING QUALITIES IN VISUAL TERRAIN FLIGHT
Robert T. N. Chen *In its* Helicopter Handling Qualities Apr. 1982 p 59-74 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

The studies were undertaken to investigate the effects of rotor design parameters, interaxis coupling, and various levels of stability and control augmentation on the flying qualities of helicopters performing low-level, terrain-flying tasks in visual meteorological conditions. Some unified results are presented, and the validity and limitations of the flying-qualities data obtained are interpreted. Selected results, related to various design parameters, provide guidelines for the preliminary design of rotor systems and aircraft augmentation systems. T.M.

N82-23216*# Boeing Vertol Co., Philadelphia, Pa.
AN ASSESSMENT OF VARIOUS SIDE-STICK CONTROLLER/STABILITY AND CONTROL AUGMENTATION SYSTEMS FOR NIGHT NAP-OF-EARTH FLIGHT USING PILOTED SIMULATION
Kenneth H. Landis and Edwin W. Aiken (Army Research and Technology Labs., Moffett Field, Calif.) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 75-96 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

Several night nap-of-the-earth mission tasks were evaluated using a helmet-mounted display which provided a limited field-of-view image with superimposed flight control symbology. A wide range of stability and control augmentation designs was investigated. Variations in controller force-deflection characteristics and the number of axes controlled through an integrated side-stick controller were studied. In general, a small displacement controller is preferred over a stiffstick controller particularly for maneuvering flight. Higher levels of stability augmentation were required for IMC tasks to provide handling qualities comparable to those achieved for the same tasks conducted under simulated visual flight conditions. T.M.

N82-23217*# Martin Marietta Corp., Orlando, Fla.
DEFINITION OF DISPLAY/CONTROL REQUIREMENTS FOR ASSAULT TRANSPORT NIGHT/ADVERSE WEATHER CAPABILITY
R. Joseph Milelli, Gary W. Mowery, and Carmen Pontelandolfo (Naval Air Development Center, Warminister, Pa.) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 97-107 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

A Helicopter Night Vision System was developed to improve low-altitude night and/or adverse weather assult transport capabilities. Man-in-the-loop simulation experiments were performed to define the minimum display and control requirements for the assult transport mission and investigate forward looking infrared sensor requirements, along with alternative displays such as panel mounted displays (PMD) helmet mounted displays (HMD), and integrated control display units. Also explored were navigation requirements, pilot/copilot interaction, and overall cockpit arrangement. Pilot use of an HMD and copilot use of a PMD appear as both the preferred and most effective night navigation combination. M.D.K.

N82-23218*# National Research Council of Canada, Ottawa (Ontario). Airborne Simulator Facility.
SOME PILOTING EXPERIENCES WITH MULTIFUNCTION ISOMETRIC SIDE-ARM CONTROLLERS IN A HELICOPTER
J. Murray Morgan *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 109-119 ref

Avail: NTIS HC A11/MF A01 CSCL 01C

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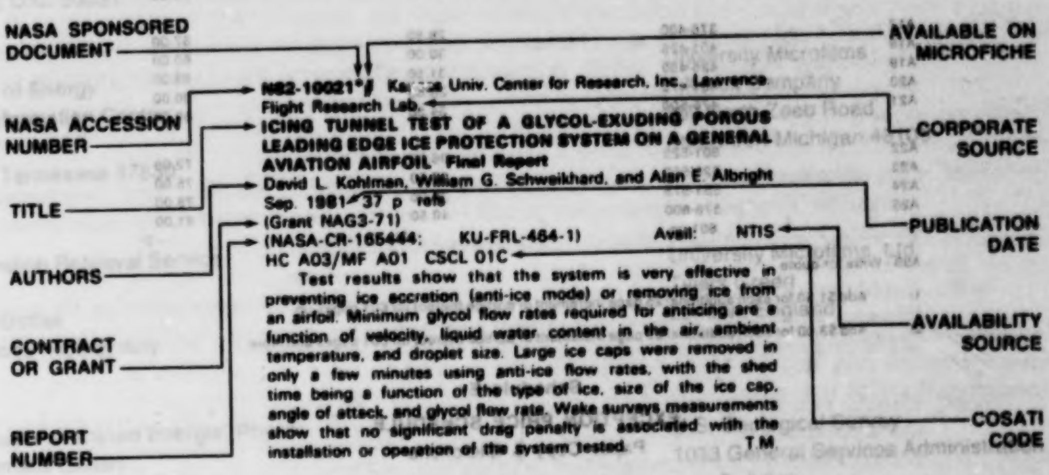

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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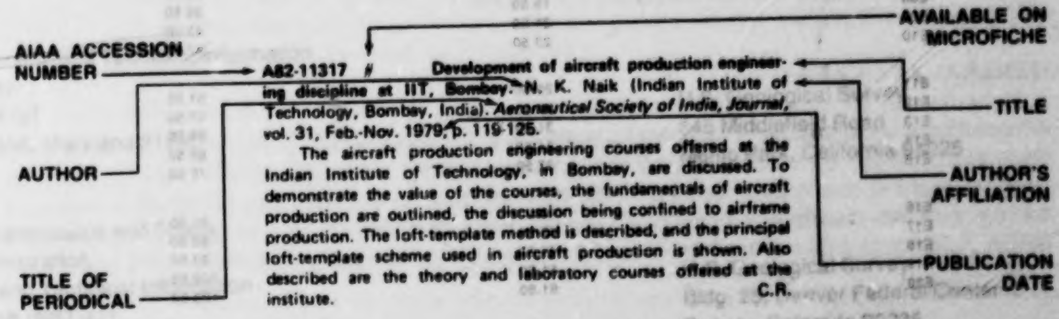

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discusion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

A Continuing Bibliography (Suppl. 151)

AUGUST 1982

IAA ENTRIES

A82-[illegible] Occurrence of fretting fatigue failures in practice. P. J. E. Forsyth (Royal Aircraft Establishment, Materials Dept., Farnborough, Hants., England). In: Fretting fatigue. London, Applied Science Publishers, Ltd., 1981, p. 99-125.

The basic characteristics of fretting fatigue are identified and practical engineering situations where fretting fatigue problems can arise are discussed. The discussion includes both commonly observed cases, such as flanges and loaded holes, and less common cases such as that of an aircraft lift strut stabilizing point where aerodynamic vibrations are developed in the member. It is pointed out that once a fretting fatigue failure has occurred in service, remedial measures can be found which will eliminate the problem. However, difficulties still arise in applications where the possibilities of fretting have not been identified at the design stage, and in pinning combinations where the engineering variables are difficult to control and where anti-fretting compounds are difficult to maintain in situ. V.L.

A82-[illegible] * Finite element thermal analysis of convectively-cooled aircraft structures. A. G. Wieting (NASA, Langley Research Center, Hampton, VA) and E. A. Thornton (Old Dominion University, Norfolk, VA). In: Numerical methods in heat transfer. Chichester, Sussex, England and New York, Wiley-Interscience, 1981, p. 431-443. 8 refs.

The design complexity and size of convectively-cooled engine and airframe structures for hypersonic transports necessitate the use of large general purpose computer programs for both thermal and structural analyses. Generally, thermal analyses are based on the lumped-parameter finite difference technique, and structural analyses are based on the finite element technique. Differences in these techniques make it difficult to achieve an efficient interface. It appears, therefore, desirable to conduct an integrated analysis based on a common technique. A summary is provided of efforts by NASA concerned with the development of an integrated thermal-structural analysis capability using the finite element method. Particular attention is given to the development of conduction/forced-convection finite element methodology and applications which illustrate the capabilities of the developed concepts. G.R.

A82-[illegible] The gas turbine engine. D. Driver, D. W. Hall, and G. W. Meetham (Rolls-Royce, Ltd., Derby, England). In: The development of gas turbine materials. London, Applied Science Publishers, 1981, p. 1-30. [illegible] refs.

An historical account is given of the developments in gas turbine engine mechanical design which, by increasing operating temperature requirements in their evolution towards greater thrust and lower fuel consumption, have strongly affected the choice of component materials. The desire to reduce powerplant weight, and especially the weight of rotating components, has also been a significant factor in the development of materials. Compressor materials, which were largely aluminum alloy in the earliest gas turbine engines, were supplemented by steels as temperatures rose above [illegible] C in the early 1950s; the development of high specific strength titanium alloys led to their application in compressor blades and casings after [illegible]. Combustion chamber and turbine materials have been [illegible] increasingly corrosion-resistant nickel-based superalloys. Attention is also given to drive shafts and bearings. O.C.

A82-[illegible] Composite materials. R. H. Turner, A. W. Johnson, and C. G. Hannah (Rolls-Royce, Ltd., Derby, England). In: The development of gas turbine materials. London, Applied Science Publishers, 1981, p. 121-140. 16 refs.

Since the development of the RB 162 engine, composite materials such as glass fiber/epoxy, glass fiber/polyimide, and carbon or graphite fiber/epoxy have displaced conventional metallic components in aircraft gas turbines through a combination of lower weight and superior performance. Applications of such composites include compressor blades and casings, fan blades, nacelle components and thrust reversers. Emphasis is put on the development of pressure-assisted resin injection and the associated molding resin system for the successful application of carbon fiber reinforced plastics. The prospective development of high-temperature, metal-matrix composites able to operate above the polymer limit of 300 C is also considered. Such composites will employ alumina, carbon and silicon carbide fibers in the reinforcement of aluminum and titanium alloy matrices. O.C.

A82-[illegible] Sheet materials - Fabrication and joining. [illegible] Hicks (Lucas Aerospace, Ltd., Fabrication Div., Burnley, Lancs., England). In: The development of gas turbine materials. London, Applied Science Publishers, 1981, p. 229-258. 47 refs.

Aircraft gas turbine engine sheet-fabricated components include fan casings, combustion chambers, and bypass and exhaust ducts of often complex shape which must be produced to high standards. Their production sequence typically entails (1) making sheet metal parts by bending, drawing, stretchforming, spinning and roll forming, after free-edge trimming and cleaning; (2) the machining of those forgings and castings which are to become an integral part of the fabricated assembly; (3) degreasing, pickling and descaling of the parts in preparation for welding; (4) tungsten inert gas or resistance welding; and (5) stress-relieving of the welded assembly and final heat treatment. [illegible] given to the properties of such sheet alloys as Nimonic 75, Hastelloy X, and Jethete M 152. [illegible]

A82-[illegible] Processing and uses of carbon fiber reinforced plastics. [illegible] Verarbeitung und Anwendung kohlenstoff[illegible] Kunststoffe, Stuttgart, [illegible] VDI-Verlag GmbH, 1981, [illegible]

After an introductory paper on the processing and uses of carbon fiber reinforced plastics (CFRP), consideration is given to high-strength carbon fibers based on polyacrylonitrile, high-modulus carbon fibers made from pitch, the surface treatment of carbon fibers, the nondestructive testing of CFRP, and [illegible] Also discussed are CFRP [illegible] the CFP design and construction of the Alpha-Jet elevator unit, the design and [illegible] analysis of the Airbus CFP rudder [illegible] components of CFP [illegible] and the use of [illegible] reinforced [illegible]

A82-[illegible] [illegible] for the Airbus [illegible] carbon-fiber reinforced plastic. H. Conen and H. Kolesnik (Dornier GmbH, Friedrichshafen, West Germany). In: Processing and uses of

A82-30143 * # **Measured and calculated effects of angle of attack on the transonic flutter of a supercritical wing.** E. C. Yates, Jr., E. C. Wynne, and M. G. Farmer (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 122-144. 19 refs. (AIAA 82-0647)

The effects of angle of attack between 0 and 4 degrees were studied. The results indicate that increasing angle of attack from zero can produce substantial changes in the transonic flutter characteristics that are favorable or unfavorable depending on Mach number and angle of attack. The bottom of the transonic flutter-boundary 'bucket' is shown to occur at lower Mach number as angle of attack increases. These flutter results correlate well with the effects of Mach number and angle of attack on aerodynamic behavior, especially on the development of transonic flow phenomena. The calculated flutter characteristics are in good agreement with the experimental data at zero angle of attack, but at nonzero angles of attack the experiments show sharply declining and backward-turning transonic flutter boundaries that are not indicated by the calculations. These may be caused by variations in static aeroelastic deformation. C.D.

A82-30144 # **Integrated structural analysis and design support for advanced launch vehicles.** D. G. Wong, R. D. Bousquet, and C. R. Fuller (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 145-150. 5 refs. (AIAA 82-0675)

The paper discusses a system incorporating the latest developments in computer hardware and software, conceived in accordance with a five year plan initiated to support future advanced launch vehicle programs at the Lockheed Missiles and Space Company. Engineering requirements for the integrated system forming the basis for the department upgrades are presented. Software attributes are discussed, including program modularity, data management, and programming standards. Hardware attributes are also presented, and include system definition and design, communication network links, and various graphical capabilities. D.L.G.

A82-30145 # **Bonded aluminum honeycomb - Aircraft flight surface primary structure application.** T. R. Logan (Boeing Commercial Airplane Co., Seattle, WA) and U. Soudak (Israel Aircraft Industries, Ltd., Tel Aviv, Israel). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 151-156. 9 refs. (AIAA 82-0676)

The first phase is discussed of a detail design and testing program undertaken to establish cost and weight data for a point-design application and to provide a basis for full-scale development and certification of a bonded aluminum honeycomb empennage structural box. The baseline design is a built-up, mechanically fastened skin/stringer configuration. Structural design goals, inherent advantages and principal constraints of the bonded design are given. Design allowables, optimum design, and substructure arrangement are discussed in detail. A preliminary study demonstrates a significant 9.9 to 14.7 percent weight saving and a 20 percent part count reduction. Potential overall manufacturing cost reduction is estimated at 40 percent. C.D.

A82-30146 * # **Design considerations and experiences in the use of composite material for an aeroelastic research wing.** C. V. Eckstrom (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA) and C. V. Spain (Kentron Technical Center, Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 157-165. 15 refs. (AIAA 82-0678)

Experiences in using composite skin material on an aeroelastic research wing used in flight flutter testing are described. Significant variations in skin shear modulus due to stress and temperature were encountered with the original fiberglass laminate skin designed to minimize wing torsional stiffness. These variations along with the sensitivity of wing torsional stiffness to the skin-to-frame attachment method complicated the structural model vibration mode predictions. A wing skin redesign with different fiber orientation and a reduction in the amount of skin-to-frame bonding resulted in more predictable modal characteristics without sacrificing design objectives. Design and modeling considerations for future applications are discussed. (Author)

A82-30147 # **Durability and damage tolerance control plans for USAF aircraft.** M. A. Landy and O. L. Smithers (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 166-174. 20 refs. (AIAA 82-0679)

A set of disciplined, integrated procedures involving a number of a contractor's functional organizations is necessary if the requirements for a durable and damage tolerant structure are to be met. To this end, the Air Force requires that Durability and Damage Tolerance Control Plans (DADTCPs) be developed and implemented during aircraft development and manufacturing. DADTCPs define all tasks necessary to ensure that the final product meets Air Force durability and damage tolerance requirements. Various aspects to DADTCPs will be discussed in this paper. The foundation for a generalized model outlining the tasks in a DADTCP will be presented. Examples from existing DADTCPs will be used to illustrate elements of the generalized model. (Author)

A82-30150 # **Rigid body-structural mode coupling on a forward swept wing aircraft.** G. D. Miller, J. H. Wykes, and M. J. Brosnan (Rockwell International Corp., El Segundo, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 201-208. 10 refs. (AIAA 82-0683)

Physical causes of rigid/body wing bending flutter of forward swept wing (FSW) aircraft are discussed, and potential solutions to the phenomenon for a Rockwell design of an FSW demonstrator are considered. The use of active controls technology to design a flutter suppression system in controling the flutter on the demonstrator is discussed, including the integration of the active system with the complete aircraft design to obtain lightweight structure while maintaining strength requirements, structural dynamic stability, and rigid body stability. Improvements in flying qualities, ride qualities and reduction in the gust loads as a result of the active control system are demonstrated. Inertial coupling in addition to wind sweep is found to be a dominant variable causing the phenomenon. D.L.G.

A82-30151 # **Active control of aeroelastic divergence.** R. R. Chipman, A. M. Zislin, and C. Waters (Grumman Aerospace Corp., Bethpage, NY). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 209-219. 15 refs. (AIAA 82-0684)

On forward-swept-wing aircraft, aerodynamic destiffening of the primary wing-bending mode can cause coupling with the short-period mode, potentially resulting in a low-frequency dynamic instability. For a clamped wing, this coupled mechanism degenerates into conventional static wing divergence. Studies of a fundamental analytical model of this mechanism show that active control of the clamped wing is possible only through the use of displacement feedback. Control laws for the clamped wing are evaluated and also assessed when body freedom is restored. Additionally, control laws are synthesized directly for a more refined representation of the unrestrained vehicle. CCV configurations are not considered. (Author)

A82-30153 * # **Static and unsteady pressure measurements on a 50 degree clipped delta wing at M = 0.9.** R. W. Hess, E. C. Wynne, and F. W. Cazier (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2.

New York, American Institute of Aeronautics and Astronautics, 1982, p. 234-242. 7 refs. (AIAA 82-0686)

Static and unsteady pressures were measured on a 50.45 degree clipped delta wing in the Langley Transonic Dynamics Tunnel with Freon as the test medium. Data taken at M = 0.9 is presented for static and oscillatory deflections of the trailing edge control surface and for the wing in pitch. Comparisons of the static measured data are made with results computed using the Bailey-Ballhaus small disturbance code. (Author)

A82-30155 # Transonic time-response analysis of three D.O.F. conventional and supercritical airfoils. T. Y. Yang (Purdue University, West Lafayette, IN) and J. T. Batina. In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 256-266. 30 refs. (AIAA 82-0688)

Aeroelastic time-response analyses are performed for two conventional airfoils, NACA 64A006 and NACA 64A010, and one supercritical airfoil MBB A-3, in small disturbance transonic flow. Response results for forces and displacements were obtained by simultaneously integrating the structural equations of motion with the unsteady aerodynamic forces computed using two transonic codes: LTRAN2-NLR (improved version of LTRAN2 by Houwink and van der Vooren of NLR, the Netherlands) and USTS (Unsteady Transonic Small Perturbation code by Isogai of NAL, Japan). Three d.o.f.'s, plunge, pitch, and aileron pitch, are considered. Flutter analyses are first performed and the results are used as a guideline for time-response parameter selection. Time-response results are presented showing that for each case the flight speed used to obtain neutrally stable responses is either exactly or nearly the same as the flutter speed determined in the separate flutter analysis. Effect of response amplitudes is investigated. Applicability and limitations of the two transonic codes are evaluated, compared, and discussed. Transonic time-response behavior of these airfoils is physically interpreted, discussed, and comparisons are made. (Author)

A82-30156 * # Application of a transonic potential flow code to the static aeroelastic analysis of three-dimensional wings. W. Whitlow, Jr. and R. M. Bennett (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 267-276. 12 refs. (AIAA 82-0689)

A method for including elastic effects in steady, transonic wing analysis is presented. Since the aerodynamic theory is nonlinear, the method requires the coupling of two iterative processes - an aerodynamic analysis and a structural analysis. A full potential analysis code, FL022, is combined with a linear structural analysis to yield aerodynamic load distributions on and deflections of elastic wings. This method was used to analyze an aeroelastically-scaled wind tunnel model of a proposed executive-jet transport wing and an aeroelastic research wing. The results are compared with the corresponding rigid-wing analyses, and some effects of elasticity on the aerodynamic loading are noted. (Author)

A82-30157 * # Comparison between computations and experimental data in unsteady three-dimensional transonic aerodynamics, including aeroelastic applications. P. Guruswamy (Informatics, Inc., Palo Alto, CA) and P. M. Goorjian (NASA, Ames Research Center, Moffett Field, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 277-289. 20 refs. (AIAA 82-0690)

Comparisons were made of computed and experimental data in three-dimensional unsteady transonic aerodynamics, including aeroelastic applications. The computer code LTRAN3, which is based on small-disturbance aerodynamic theory, was used to obtain the aerodynamic data. A procedure based on the U-g method was developed to compute flutter boundaries by using the unsteady aerodynamic coefficients obtained from LTRAN3. The experimental data were obtained from available NASA publications. All the studies were conducted for thin, unswept, rectangular wings with circular-arc cross sections. Numerical and experimental steady and unsteady aerodynamic data were compared for a wing with an aspect ratio of 3 and a thickness ratio of 5% at Mach numbers of 0.7 and 0.9. Flutter data were compared for a wing with an aspect ratio of 5. Two thickness ratios, 6% at Mach numbers of 0.715, 0.851, and 0.913, and 4% at Mach number of 0.904, were considered. Based on the unsteady aerodynamic data obtained from LTRAN3, flutter boundaries were computed; they were compared with those obtained from experiments and the code NASTRAN, which uses linear aerodynamics. (Author)

A82-30161 # Analysis of aircraft dynamic behavior in a crash environment. G. Wittlin (Lockheed-California Co., Burbank, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 316-325. 20 refs. Army-sponsored research. (AIAA 82-0694)

Differences in the crash environments and design aspects which influence occupant survivability in military and commercial aircraft are discussed. Available analytical techniques for assessing structural behavior during a crash are described. The application of a hybrid technique in assessing aircraft structural behavior and trends in crash environments is provided. Representative mathematical simulations of aircraft crash tests and correlation with light fixed-wing and rotary-wing aircraft test results are shown. The results of a recent FAA/NASA sponsored research program involving the review of transport accidents from 1964-79 and the formulation of potential crash scenarios to be considered with future analysis and test verification are presented. Current and future analytical model studies to ascertain the crash dynamics of large transports are also discussed. (Author)

A82-30162 * # Bird impact analysis package for turbine engine fan blades. M. S. Hirschbein (NASA, Lewis Research Center, Cleveland, OH). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 326-334. 8 refs. (AIAA 82-0696)

A computer program has been developed to analyze the gross structural response of turbine engine fan blades subjected to bird strikes. The program couples a NASTRAN finite element model and modal analysis of a fan blade with a multi-mode bird impact analysis computer program. The impact analysis uses the NASTRAN blade model and a fluid jet model of the bird to interactively calculate blade loading during a bird strike event. The analysis package is computationaly efficient, easy to use and provides a comprehensive history of the gross structual blade response. Example cases are presented for a representative fan blade. (Author)

A82-30168 * # Damage tolerant design using collapse techniques. R. T. Haftka (Virginia Polytechnic Institute and State University, Blacksburg, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 383-386. 13 refs. Grant No. NAG1-168. (AIAA 82-0718)

A new approach to the design of structures for improved global damage tolerance is presented. In its undamaged condition the structure is designed subject to strength, displacement and buckling constraints. In the damaged condition the only constraint is that the structure will not collapse. The collapse load calculation is formulated as a maximization problem and solved by an interior extended penalty function. The design for minimum weight subject to constraints on the undamaged structure and a specified level of the collapse load is a minimization problem which is also solved by a penalty function formulation. Thus the overall problem is of a nested or multilevel optimization. Examples are presented to demonstrate the difference between the present and more traditional approaches. (Author)

A82-30169 # Shape optimization of fiber reinforced composites. S. V. Hanagud, A. Chattapadhyay, and L. Karlovitz (Georgia Institute of Technology, Atlanta, GA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2.

during the approach and landing task. The effects of approach path angle, approach airspeed, and pilot technique using throttle/spoiler integrated control were investigated for day, night, VFR, and IFR approaches and landings. The test results indicated that spoilers offered significant improvements in the vehicle's performance and flying qualities for all elements of the approach and landing task, provided a suitable method of control was available. Author

N82-22244*# Sinacori (John B.) Associates, Hollister, Calif.
CONCEPTUAL DESIGN STUDY OF A VISUAL SYSTEM FOR A ROTORCRAFT SIMULATOR AND SOME ADVANCES IN PLATFORM MOTION UTILIZATION Final Report
John B. Sinacori Aug. 1980 33 p refs
(Contract NAS2-10278)
(NASA-CR-166322; NAS 1.26:166322) Avail: NTIS HC A03/MF A01 CSCL 14B

A conceptual design of a visual system for a rotorcraft flight simulator is presented. Also, drive logic elements for a coupled motion base for such a simulator are given. The design is the result of an assessment of many potential arrangements of electro-optical elements and is a concept considered feasible for the application. The motion drive elements represent an example logic for a coupled motion base and is essentially an appeal to the designers of such logic to combine their washout and braking functions. Author

N82-22245*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A LINEAR DECOMPOSITION METHOD FOR LARGE OPTIMIZATION PROBLEMS. BLUEPRINT FOR DEVELOPMENT
Jaroslaw Sobieszczanski-Sobieski Feb. 1982 61 p refs
(NASA-TM-83248; NAS 1.15:83248) Avail: NTIS HC A04/MF A01 CSCL 01C

A method is proposed for decomposing large optimization problems encountered in the design of engineering systems such as an aircraft into a number of smaller subproblems. The decomposition is achieved by organizing the problem and the subordinated subproblems in a tree hierarchy and optimizing each subsystem separately. Coupling of the subproblems is accounted for by subsequent optimization of the entire system based on sensitivities of the suboptimization problem solutions at each level of the tree to variables of the next higher level. A formalization of the procedure suitable for computer implementation is developed and the state of readiness of the implementation building blocks is reviewed showing that the ingredients for the development are on the shelf. The decomposition method is also shown to be compatible with the natural human organization of the design process of engineering systems. The method is also examined with respect to the trends in computer hardware and software progress to point out that its efficiency can be amplified by network computing using parallel processors. B.W.

N82-22246*# National Aeronautics and Space Administration, Washington, D. C.
REVOLUTION IN AIRPLANE CONSTRUCTION? GROB G110: THE FIRST MODERN FIBER GLASS COMPOSITION AIRPLANE SHORTLY BEFORE ITS MAIDEN FLIGHT
R. Dorpinghaus Mar. 1982 19 p Transl. into ENGLISH from Aerokurier (West Germany), no. 12, Dec. 1981 p 1550-1555 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76705; NAS 1.15:76705) Avail: NTIS HC A02/MF A01 CSCL 01C

A single engine two passenger airplane, constructed completely from fiber reinforced plastic materials is introduced. The cockpit, controls, wing profile, and landing gear are discussed. Development of the airframe is also presented. S.L.

N82-22247*# National Aeronautics and Space Administration, Washington, D. C.
SOCATA: TB 20 TRINIDAD GIVEN GERMAN DEBUT
B. Malzbender Mar. 1982 13 p Transl. into ENGLISH from Aerokurier (West Germany), no. 12, Dec. 1981 p 1543, 1546-1547 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76706; NAS 1.15:76706) Avail: NTIS HC A02/MF A01 CSCL 01C

Pilot impressions gained in a first flight in the 250 HP single engine TB 20 prototype aircraft are presented along with aircraft specifications. A.R.H.

N82-22248*# Systems Technology, Inc., Hawthorne, Calif.
FUNCTIONAL REQUIREMENTS FOR THE MAN-VEHICLE SYSTEMS RESEARCH FACILITY
Warren F. Clement, R. Wade Allen, Robert K. Heffley, Wayne F. Jewell, Henry R. Jex, Duane T. McRuer, Ted M. Schulman, and Robert L. Stapleford Oct. 1980 221 p refs
(Contract NAS2-10400)
(NASA-CR-166315; NAS 1.26:166315; TR-1156-3) Avail: NTIS HC A10/MF A01 CSCL 01C

The NASA Ames Research Center proposed a man-vehicle systems research facility to support flight simulation studies which are needed for identifying and correcting the sources of human error associated with current and future air carrier operations. The organization of research facility is reviewed and functional requirements and related priorities for the facility are recommended based on a review of potentially critical operational scenarios. Requirements are included for the experimenter's simulation control and data acquisition functions, as well as for the visual field, motion, sound, computation, crew station, and intercommunications subsystems. The related issues of functional fidelity and level of simulation are addressed, and specific criteria for quantitative assessment of various aspects of fidelity are offered. Recommendations for facility integration, checkout, and staffing are included. A.R.H.

N82-22249*# Systems Technology, Inc., Hawthorne, Calif.
TECHNICAL APPROACHES FOR MEASUREMENT OF HUMAN ERRORS Final Report
Warren F. Clement, Robert K. Heffley, Wayne F. Jewell, and Duane T. McRuer May 1980 140 p refs
(Contract NAS2-10400)
(NASA-CR-166314; NAS 1.26:166314; STI-TR-1156-2) Avail: NTIS HC A07/MF A01 CSCL 01C

Human error is a significant contributing factor in a very high proportion of civil transport, general aviation, and rotorcraft accidents. The technical details of a variety of proven approaches for the measurement of human errors in the context of the national airspace system are presented. Unobtrusive measurements suitable for cockpit operations and procedures in part of full mission simulation are emphasized. Procedure, system performance, and human operator centered measurements are discussed as they apply to the manual control, communication, supervisory, and monitoring tasks which are relevant to aviation operations. S.L.

N82-22250*# Systems Technology, Inc., Hawthorne, Calif.
A THEORY OF HUMAN ERROR Final Report
Duane T. McRuer, Warren F. Clement, and R. Wade Allen May 1980 91 p refs
(Contract NAS2-10400)
(NASA-CR-166313; NAS 1.26:166313; STI-TR-1156-1) Avail: NTIS HC A05/MF A01 CSCL 01C

Human error, a significant contributing factor in a very high proportion of civil transport, general aviation, and rotorcraft accidents is investigated. Correction of the sources of human error requires that one attempt to reconstruct underlying and contributing causes of error from the circumstantial causes cited in official investigative reports. A validated analytical theory of the input-output behavior of human operators involving manual control, communication, supervisory, and monitoring tasks which are relevant to aviation operations is presented. This theory of behavior, both appropriate and inappropriate, provides an insightful basis for investigating, classifying, and quantifying the needed cause-effect relationships governing propagation of human error. B.W.

N82-22251*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PERFORMANCE TESTING OF A MAIN ROTOR SYSTEM FOR A UTILITY HELICOPTER AT 1/4 SCALE
John D. Berry (Army Aviation Research and Development Command, Langley, Va.) Apr. 1982 49 p refs
(DA Proj. 1L1-61102-AH-45)
(NASA-TM-83274; L-15015; NAS 1.15:83274; AVRADCOM-TR-82-B-3) Avail: NTIS HC A03/MF A01 CSCL 01C

Two rotor systems for the UH-1 helicopter were tested in hover and forward flight. The baseline system was a dynamically scaled model of the current rotor system, while the other system was designed for advanced performance. In hover out of ground effect, the advanced rotor system shows improvements up to 10 percent in the figure of merit and improvements in thrust up to 7 percent. In forward flight, the advanced rotor system demonstrated reductions in required torque throughout the range of conditions tested, with reductions up to 17 percent occurring at the higher advance ratios and higher lift values tested. T.M.

N82-22252*# Hydraulic Research Textron, Valencia, Calif.
AN ELECTRONIC CONTROL FOR AN ELECTROHYDRAULIC ACTIVE CONTROL LANDING GEAR FOR THE F-4 AIRCRAFT Final Report
Irving Ross Washington Apr. 1982 92 p refs
(Contract NAS1-16420)
(NASA-CR-3552; NAS 1.26:3552; HR-74600000) Avail: NTIS HC A05/MF A01 CSCL 01C

A controller for an electrohydraulic active control landing gear was developed for the F-4 aircraft. A controller was modified for this application. Simulation results indicate that during landing and rollout over repaired bomb craters the active gear effects a force reduction, relative to the passive gear, or approximately 70%. S.L.

N82-22253# British Aerospace Aircraft Group, Weybridge (England).
TAILOR-MADE STRUCTURES; TODAY, AND TOMORROW: NEW MATERIALS, AN EXPLORATORY INVESTIGATION INTO THEIR POTENTIAL USE
W. J. Bird 16 Apr. 1980 48 p
(BAe-SDW-85/A/104/005) Avail: NTIS HC A03/MF A01

The use of fiber/matrix combinations, e.g. in a nonmetallic airplane, is discussed. The development of fiber/matrix structures is hindered by an absence of design experience, designers whose experience is in metallics rather than textiles, the conservative structures employed, and production times for fiber components. A modular tooling system is proposed. The structural feasibility of the aircraft is established by examining the possibility of constructing VC-10 components in fiber/matrix materials. Author (ESA)

N82-22254# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
A COMPLETE METHOD FOR COMPUTATION OF BLADE MODE CHARACTERISTICS AND RESPONSES IN FORWARD FLIGHT
J. P. Lefrancq and B. Masure Paris 1981 10 p refs Presented at 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-101) Avail: NTIS HC A02/MF A01

The model approach to rotor dynamic behavior is outlined, and an azimuth method is presented. The azimuth method applies to stabilized flights, in particular those in which rotor configuration is considered repeatable after one revolution. Excitation occurs at rotor frequency (R+F) or at multiples of it. Rotor behavior is developed in a Fourier series of which basic frequency is R+F. The series terms are considered negligible beyond the nth harmonic. Development coefficient counts show that (2n+1) successive positions (azimuths), regularly spread over the revolution, can describe rotor behavior. Accuracy depends on the number n of harmonics retained. The n number selection depends on computer capacity. Author (ESA)

N82-22255# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
NAVAL VERSIONS OF THE DAUPHIN AND THE AS 15 TT WEAPON SYSTEM
J. P. Dubreuil Paris 1981 11 p Presented at the 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-104) Avail: NTIS HC A02/MF A01

Modifications needed to adapt the Dauphin N helicopter for naval rescue and attack missions are outlined. The antisurface vessel weapon system is described. Maximum continuous engine power is increased from 437 to 488 kW, takeoff power from 492 to 552. Pressure refueling is possible in-flight or on-ground. Blades and fin fold. A hydraulic mooring harpoon is located between the two wheels of the main landing gear. A radar system, adopted from army versions, provides overall accuracy > 3% of distance covered. The tail assembly is watertight. The AS 15 TT has a range > 15 km, is roll stabilized, has a 30 kg warhead, and flies a few m above the surface, descending near the target just before impact. Author (ESA)

N82-22256# Societe Nationale Industrielle Aerospatiale, La Courneuve (France). Helicopter Div.
A LIGHT HELICOPTER FOR NIGHT FIRING
J. F. Candau Paris 1981 19 p Presented at the 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-105) Avail: NTIS HC A02/MF A01

An antitank helicopter suitable for night operation over difficult terrain is described. A Dauphin helicopter, equipped with HOT missiles, is treated with low IR reflectance paint and antireflective coating of glazed areas. Jet exhaust is deviated, engine cowlings reduce IR emission. Targets are sought by a passive system of thermal imagery. Outside surroundings are viewed via a nocturnal vision device operating on the light intensification principle. The navigation system is self-contained. The missile is guided by a localizer coupled to, and harmonized with a thermal camera, mounted on a gyrostabilized platform. Tanks are detected up to 4 km and identified up to 2 km. Author (ESA)

N82-22257# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
CONCEPT STUDIES OF AN ADVANCED COMPOSITE HELICOPTER FIN
A. Desmonceaux and M. Torres Paris 1981 13 p Presented at the 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-106) Avail: NTIS HC A02/MF A01

A composite fin and fan in fin assembly was developed for the Dauphin 2. The structure is made of epoxy resin preimpregnated Kevlar or graphite, single or two direction fiber cloths. A single block construction is used in heavily loaded areas or areas stabilized through a sharp curvature. A sandwich construction with Nomex honeycomb filler is used where loads are less. Static tests and theoretical studies show that maximum thrust is increased by 40% compared with a similar weight metal structure. Production costs are reduced by eliminating a great number of parts and assemblies. Operating costs are lowered by abolishing corrosion risks and improving maintenance through the simpler design. The fail safe composites increase safety. Author (ESA)

N82-22258# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.
TAIL ROTOR STUDIES FOR SATISFACTORY PERFORMANCE: STRENGTH AND DYNAMIC BEHAVIOR
G. Blachere and F. dAmbra Paris 1981 13 p refs Presented at 7th European Rotocraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-821-210-108) Avail: NTIS HC A02/MF A01

Flexbeam, teetered, cantilevered and semirigid two bladed rotors were studied in flight, on whirl test stands and theoretically. The blades are compared with conventional helicopter blades. For 2 ton helicopters, the tested blades have fewer parts, and weigh less than conventional ones. Blade life is increased, manufacturing and maintenance costs are lowered. For 8 ton helicopters, similar improvements were achieved, but at the expense of larger control forces and limited lifetime for the flexbeam. Author (ESA)

N82-22259# Institut de Mecanique des Fluides de Lille (France).
APPLICATION OF KALMAN FILTERING TO THE KINEMATIC RECONSTRUCTION OF FREE FLIGHT OF CATAPULTED AIRCRAFT MODELS IN THE LABORATORY [APPLICATION DU FILTRAGE DE KALMAN A LA RESTITUTION DE LA CINEMATIQUE DES MAQUETTES D'AVION CATAPULTEES EN VOL LIBRE EN LABORATOIRE]
P. Coton 30 Jun. 1980 15 p In FRENCH
(IMFL-80-28; IMFL-8214) Avail: NTIS HC A02/MF A01

A Kalman filtering procedure was developed in order to improve results obtained with a catapult and aircraft model. Application of this procedure is criticized. It is concluded that the procedure as it stands is unreliable. Reconfiguration of the in the NAE Airborne Simulator, a modified, variable stability Bell 205 A is described, as is the development of various control systems for use with them. The results of two experiments are presented indicating both the feasibility and acceptability of such systems for a wide variety of tasks in a conventional single rotor helicopter, with a minimum of stability augmentation. Areas of future research are indicated. Author

N82-23219*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
RESULTS OF NASA/FAA GROUND AND FLIGHT SIMULATION EXPERIMENTS CONCERNING HELICOPTER IFR AIRWORTHINESS CRITERIA
J. Victor Lebacqz, Robert T. N. Chen, Ronald M. Gerdes, Jeanine M. Weber, and Raymond D. Forrest (FAA, Moffett Field, Calif.) *In its* Helicopter Handling Qualities 1 Apr. 1982 p 121-138 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

A sequence of ground and flight simulation experiments was conducted to investigate helicopter instrument-flight-rules airworthiness criteria. The first six of these experiments and major results are summarized. Five of the experiments were conducted on large-amplitude motion base simulators. The NASA-Army V/STOLAND UH-1H variable-stability helicopter was used in the flight experiment. Artificial stability and control augmentation, longitudinal and lateral control, and in pitch and roll attitude augmentation were investigated. M.D.K.

N82-23220*# Rockwell International Corp., Cedar Rapids, Iowa. Government Avionics Div.
STATE-OF-THE-ART COCKPIT DESIGN FOR THE HH-65A HELICOPTERS
Daniel E. Castleberry and Marsha Y. McElreath *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 139-143 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

In the design of a HH-65A helicopter cockpit, advanced integrated electronics systems technology was employed to achieve several important goals for this multimission aircraft. They were: (1) integrated systems operation with consistent and simplified cockpit procedures; (2) mission-task-related cockpit displays and controls, and (3) reduced pilot instrument scan effort with excellent outside visibility. The integrated avionics system was implemented to depend heavily upon distributed but complementary processing, multiplex digital bus technology, and multifunction CRT controls and displays. This avionics system was completely flight tested and will soon enter operational service with the Coast Guard. M.D.K.

N82-23221*# Ohio State Univ., Columbus.
PERFORMANCE EVALUATION OF A KINESTHETIC-TACTUAL DISPLAY
Richard J. Jagacinski, John M. Flach, Richard D. Gilson, and Richard S. Dunn (Army Research and Technology Lab., Moffett Field, Calif.) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 145-150 refs

(Grant NsG-2179)
Avail: NTIS HC A11/MF A01 CSCL 01C

Simulator studies demonstrated the feasibility of using kinesthetic-tactual (KT) displays for providing collective and cyclic command information, and suggested that KT displays may increase pilot workload capability. A dual-axis laboratory tracking task suggested that beyond reduction in visual scanning, there may be additional sensory or cognitive benefits to the use of multiple sensory modalities. Single-axis laboratory tracking tasks revealed performance with a quickened KT display to be equivalent to performance with a quickened visual display for a low frequency sum-of-sinewaves input. In contrast, an unquickened KT display was inferior to an unquickened visual display. Full scale simulator studies and/or inflight testing are recommended to determine the generality of these results. Author

N82-23222*# Army Avionics Research and Development Activity, Fort Monmouth, N. J. Avionics Lab.
SYNTHESIS OF AN INTEGRATED COCKPIT MANAGEMENT SYSTEM
Joseph A. Dasaro and Charles T. Elliott *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 151-162 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

The process used in the synthesis of an integrated cockpit management system was discussed. Areas covered included flight displays, subsystem management, checklists, and procedures (both normal and emergency). The process of evolving from the unintegrated conventional system to the integrated system is examined and a brief description of the results presented. M.D.K.

N82-23223*# United Technologies Corp., East Hartford, Conn. Aircraft Div.
THE ROLE OF VOICE TECHNOLOGY IN ADVANCED HELICOPTER COCKPITS
Howard P. Harper *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 163-170 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

The status of voice output and voice recognition technology in relation to helicopter cockpit applications is described. The maturing of this technology provides many opportunities for new approaches to crew workload reduction. The helicopter operating environment, potential application areas, and the impact on advanced cockpit design are discussed. Author

N82-23224*# Pacer Systems, Inc., Arlington, Va.
COCKPIT INTEGRATION FROM A PILOT'S POINT OF VIEW
David L. Green *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 171-181

Avail: NTIS HC A11/MF A01 CSCL 01C

Extensive experience in both operational and engineering test flight was used to suggest straightforward changes to helicopter cockpit and control system design that would improve pilot performance in marginal and instrument flight conditions. Needed control system improvements considered include: (1) separation of yaw from cyclic force trim; (2) pedal force proportional to displacement rate; and (3) integration of engine controls in collective stick. Display improvements needed include: (1) natural cuing of yaw rate in attitude indicator; (2) collective position indication and radar altimeter placed within primary scan; and (3) omnidirectional display of full range airspeed data. M.D.K.

N82-23225*# Costruzioni Aeronautiche Giovanni Agusta S.p.A., Samarate (Italy). Helicopter Systems Engineering Div.
INTEGRATED COCKPIT FOR A-129
Filippo Reina, James J. Gracia (Harris Government Information Systems Div.), and Bryce W. Koth (Harris Government Information Systems Div.) *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 183-192

Avail: NTIS HC A11/MF A01

Weight, size, and mission requirements for the A-129 mandated an integrated system approach for the crew/cockpit interface design. Instead of the usual multitude of cockpit controls, indicators, gauges, and lights, the primary crew interface is a single multifunction keyboard and one or more multifunction CRT display units. This cockpit design approach imposed unusual constraints upon the system architecture to overcome the inherent information access limitations of a data input/output window that was restricted by the available space. The conceptual approach and resulting design of the A-129 cockpit with the intent to enhance the development of cockpit standardization are described. Author

N82-23226*# Systems Technology, Inc., Hawthorne, Calif.
NEW DEVELOPMENT IN FLYING QUALITIES WITH APPLICATION TO ROTARY WING AIRCRAFT
Roger H. Hoh *In* NASA. Ames Research Center Helicopter Handling Qualities 9 Apr. 1982 p 193-198 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

Some recent considerations and developments in handling quality criteria are reviewed with emphasis on using fixed wing experience gained in developing MIL-F-8785C and the more recent MIL Standard and Handbook. Particular emphasis is placed on the tasks and environmental conditions used to develop the criterion boundaries, SAS failures, and potential fixed wing criteria that are applicable to rotary wing aircraft. Author

N82-23227*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

HELICOPTER SIMULATION TECHNOLOGY: AN AMES RESEARCH CENTER PERSPECTIVE

Richard S. Bray *In its* Helicopter Handling Qualities Apr. 1982 p 199-208 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

The total experience for evidence regarding the levels of motion and visual cueing fidelity required for handling-qualities research in ground-based simulators is reviewed. Positive contributions of cockpit motion were identified, but much remains to be learned regarding the sensitivities of individual control modes to cueing attenuation. A firmer understanding of the pilot's utilization of visual and motion cues is the key to more efficient use of simulation in helicopter control-systems research. Author

N82-23228*# Stanford Univ., Calif. Joint Inst. of Aeronautics and Acoustics.

PAST APPLICATIONS AND FUTURE POTENTIAL OF VARIABLE STABILITY RESEARCH HELICOPTERS

William S. Hindson *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 209-219 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

The historical development of variable-stability research helicopters and some of their previous applications are presented as a guide for assessing their future potential. The features of three general-purpose rotary-wing flight research aircraft that provide complementary capabilities are described briefly, and a number of future applications are proposed. Author

N82-23229*# Systems Technology, Inc., Mountain View, Calif.

A PILOT IN THE LOOP ANALYSIS OF HELICOPTER ACCELERATION/DECELERATION MANEUVERS

Robert K. Heffley *In* NASA. Ames Research Center Helicopter Handling Qualities Apr. 1982 p 221-232 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

Helicopter flight acceleration/deceleration maneuvers are quantified and put to use in the fields of handling qualities, flight training and evaluation of simulator fidelity. The three specific cases include the normal speed change maneuver, the nap-of-the-Earth dash/quickstop, and the decelerating approach to hover. All of these maneuvers share common generic features in terms of pilot adaptation and mathematical description: yet each differs in terms of the essential feedback loop structure, implications for handling qualities requirements, and simulator fidelity criteria. Author

N82-23230*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

APPLICATIONS OF SYSTEM IDENTIFICATION METHODS TO THE PREDICTION OF HELICOPTER STABILITY, CONTROL AND HANDLING CHARACTERISTICS

G. D. Padfield (RAE, Bedford, England) and R. K. DuVal *In its* Helicopter Handling Qualities Apr. 1982 p 233-247 refs

Avail: NTIS HC A11/MF A01 CSCL 01C

A set of results on rotorcraft system identification is described. Flight measurements collected on an experimental Puma helicopter are reviewed and some notable characteristics highlighted. Following a brief review of previous work in rotorcraft system identification, the results of state estimation and model structure estimation processes applied to the Puma data are presented. The results, which were obtained using NASA developed software, are compared with theoretical predictions of roll, yaw and pitching moment derivatives for a 6 degree of freedom model structure. Anomalies are reported. The theoretical methods used are described. A framework for reduced order modelling is outlined. Author

N82-23231* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

SUN SENSING GUIDANCE SYSTEM FOR HIGH ALTITUDE AIRCRAFT Patent

Robert D. Reed, Principal Investigator Issued 27 Apr. 1982 7 p Filed 12 Mar. 1980 Supersedes N80-20249 (18 - 11, p 1375)
(NASA-Case-FRC-11052-1; US-Patent-4,326,685; US-Patent-Appl-SN-129783; US-Patent-Class-244-175; US-Patent-Class-244-188; US-Patent-Class-244-190; US-Patent-Class-318-580) Avail: US Patent and Trademark Office CSCL 17G

A sun sensing guidance system for high altitude aircraft is described. The system is characterized by a disk shaped body mounted for rotation aboard the aircraft in exposed relation to solar radiation. The system also has a plurality of mutually isolated chambers: each chamber being characterized by an opening having a photosensor disposed therein and arranged in facing relation with the opening for receiving incident solar radiation and responsively providing a voltage output. Photosensors are connected in paired relation through a bridge circuit for providing heading error signals in response to detected imbalances in intensities of solar radiation.

Official Gazette of the U.S. Patent and Trademark Office

N82-23233*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ANALYSIS AND MONTE CARLO SIMULATION OF NEAR-TERMINAL AIRCRAFT FLIGHT PATHS

James R. Schiess and Christine G. Matthews (Computer Sciences Corp.) Apr. 1982 39 p refs
(NASA-TP-1997; L-15062; NAS 1.60:1997) Avail: NTIS HC A03/MF A01 CSCL 17G

The flight paths of arriving and departing aircraft at an airport are stochastically represented. Radar data of the aircraft movements are used to decompose the flight paths into linear and curvilinear segments. Variables which describe the segments are derived, and the best fitting probability distributions of the variables, based on a sample of flight paths, are found. Conversely, given information on the probability distribution of the variables, generation of a random sample of flight paths in a Monte Carlo simulation is discussed. Actual flight paths at Dulles International Airport are analyzed and simulated. E.L.

N82-23234*# Lockheed-Georgia Co., Marietta.

DETERMINATION OF WIND TUNNEL CONSTRAINT EFFECTS BY A UNIFIED PRESSURE SIGNATURE METHOD. PART 1: APPLICATIONS TO WINGED CONFIGURATIONS Final Report, Oct. 1980 - Nov. 1981

J. E. Hackett, S. Sampath, and C. G. Phillips Jun. 1981 185 p refs 2 Vol.
(Contract NAS2-9883)
(NASA-CR-166186; NAS 1.26:166186; LG81ER0166-Pt-1) Avail: NTIS HC A09/MF A01 CSCL 01C

A new, fast, non-iterative version of the 'Wall Pressure Signature Method' is described and used to determine blockage and angle-of-attack wind tunnel corrections for highly-powered jet-flap models. The correction method is complemented by the application of tangential blowing at the tunnel floor to suppress flow breakdown there, using feedback from measured floor pressures. This tangential blowing technique was substantiated by subsequent flow investigations using an LV. The basic tests on an unswept, knee-blown, jet flapped wing were supplemented to include the effects of slat-removal, sweep and the addition of unflapped tips. C sub mu values were varied from 0 to 10 free-air C sub l's in excess of 18 were measured in some cases. Application of the new methods yielded corrected data which agreed with corresponding large tunnel 'free air' resuls to within the limits of experimental accuracy in almost all cases. A program listing is provided, with sample cases. Author

N82-23235*# Lockheed-Georgia Co., Marietta.

DETERMINATION OF WIND TUNNEL CONSTRAINT EFFECTS BY A UNIFIED PRESSURE SIGNATURE METHOD. PART 2: APPLICATION TO JET-IN-CROSSFLOW Final Report, Oct. 1980 - Nov. 1981

J. E. Hackett, S. Sampath, C. G. Phillips Jun. 1981 186 p refs 2 Vol.
(Contract NAS2-9883)
(NASA-CR-166187; NAS 1.26:166187; LG81ER0167-Pt-2) Avail: NTIS HC A09/MF A01 CSCL 01C

The development of an improved jet-in-crossflow model for estimating wind tunnel blockage and angle-of-attack interference is described. Experiments showed that the simpler existing models fall seriously short of representing far-field flows properly. A new, vortex-source-doublet (VSD) model was therefore developed which employs curved trajectories and experimentally-based singularity strengths. The new model is consistent with existing and new experimental data and it predicts tunnel wall (i.e. far-field) pressures properly. It is implemented as a preprocessor to the wall-pressure-signature-based tunnel interference predictor. The supporting experiments and theoretical studies revealed some new results. Comparative flow field measurements with 1-inch 'free-air' and 3-inch impinging jets showed that vortex penetra-

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carbon fibre reinforced plastics. Düsseldorf, VDI-Verlag GmbH, 1981, p. 151-166. Translation.

A detailed description is given of the design and construction of a carbon fiber-reinforced plastic (CRP) elevator structure for the Alpha-Jet trainer aircraft. The spar box of the elevator unit consists of two continuous CRP shells and 11 metal ribs, and the remainder of the assembly consists of CRP, or glass reinforced plastic, or a combination of the two. Attention is given to comparisons of structural complexity and production costs for the conventional metallic and CRP elevator units, laminate construction details, the stiffening of the spar box shells by means of a supporting sandwich, and preparation of the spar box for autoclaving. A weight saving of 18% has been demonstrated for the CRP structure, which in fatigue tests has exhibited a 20,000 flying hours capability. O.C.

A82-28659 **The effect of swirl burner aerodynamics on NOx formation.** T. C. Claypole and N. Syred (University College, Cardiff, Wales). In: Symposium /International/ on Combustion, 18th, Waterloo, Ontario, Canada, August 17-22, 1980, Proceedings. Pittsburgh, PA, Combustion Institute, 1981, p. 81-89. 17 refs. Research supported by the Science Research Council.

When swirl is applied to the combustion air of a burner, a complex, highly turbulent flow field is established which produces very stable flames. There is currently little information available regarding the effect of the swirl on pollutant formation. The current investigation is concerned with the influence of the levels of swirl on the aerodynamics and NOx emissions at constant load. The instantaneous velocities in the experiments are measured by dual beam laser anemometry. The flame is sampled with the aid of a quartz probe. It is found that to establish the source of pollutants in a swirl combustor, it is essential to consider the pollutant mass flow profiles. The recirculation zone, despite elevated temperatures, does not appear to play a major role in the formation of NOx. G.R.

A82-28660 **NOx formation in flat, laminar, opposed jet methane diffusion flames.** W. A. Hahn and J. O. L. Wendt (Arizona, University, Tucson, AZ). In: Symposium /International/ on Combustion, 18th, Waterloo, Ontario, Canada, August 17-22, 1980, Proceedings. Pittsburgh, PA, Combustion Institute, 1981, p. 121-129; Comments, p. 129-131. 18 refs. U.S. Environmental Protection Agency Grant No. R-803715; Contract No. 68-02-2631.

Diffusion flames can play a useful role in the study of the kinetic mechanisms of pollutant formation. A laminar diffusion flame which has a number of useful attributes is the flat laminar opposed jet diffusion flame. Such a flame is established between two coaxial opposed jets, one being fuel only and the other being oxidizer only, impinging on one other. This flame is strained in its own plane, and it can be envisioned as a prototype model for laminar flamelets in turbulent diffusion flames. It is shown that the considered flame, having a given stretching rate, is one dimensional in temperature, concentration, and axial, but not radial, velocity profiles, provided the correct boundary conditions are employed for the velocities of the two incoming jets. G.R.

A82-28692 **The combustion of a fuel jet in a stream of lean gaseous fuel-air mixtures.** G. A. Karim, I. Wierzba, M. Metwally, and K. Mohan (Calgary, University, Calgary, Alberta, Canada). In: Symposium /International/ on Combustion, 18th, Waterloo, Ontario, Canada, August 17-22, 1980, Proceedings. Pittsburgh, PA, Combustion Institute, 1981, p. 977-990; Comments, p. 990, 991. 8 refs. Research supported by the National Research Council of Canada, Imperial Oil, Ltd., and University of Calgary.

The purpose is to establish the way in which the presence of a fuel vapor homogeneously dispersed in the surrounding air influences the burning characteristics of the jet flame and the corresponding flammability limits for both co-flowing and contra-flowing surrounding streams in the presence of a pilot jet diffusion flame. A wide range of jet diameters and discharge velocities is employed involving methane or hydrogen at ambient temperature and pressure. Both laminar and turbulent co-flowing streams are considered; the streams involve a range of gaseous fuel-air mixtures and include methane, hydrogen, propane and ethylene. It is shown that the presence of very small concentrations of fuel in the surroundings of the jet flame tends to increase the flame thickness and height and to considerably enhance its stabilization. It is also found that the detected flame spread lean limit of the fuels is essentially independent of the type of jet fuel and the initial jet discharge velocity. C.R.

A82-28738 **The relaxation oscillation in ramjet combustion.** N. Huang (Beijing Institute of Aeronautics and Astronautics, Beijing, People's Republic of China). In: Symposium /International/ on Combustion, 18th, Waterloo, Ontario, Canada, August 17-22, 1980, Proceedings. Pittsburgh, PA, Combustion Institute, 1981, p. 1891-1897. 20 refs.

A mechanism of low frequency relaxation oscillation in ramjet combustion is proposed. Initial pressure disturbances induce combustion instability which results in periodic heat release. Acting as feedback, the periodic heat release boosts the pressure pulsations. The complex shock wave system separating the supersonic and subsonic flows may be replaced by a virtual normal shock which shifts back and forth in the diffuser duct in response to the pulsating pressure. The cold gas column expands or contracts like a buffer plug between the virtual normal shock and the flame front in accordance with the pulsating combustion downstream. This chain of actions and reactions results in a self-excited nonlinear relaxation oscillation with irregular frequency. The proposed mechanism explains quite well the oscillograph obtained from the rig testing of a 220 mm ramjet engine in a free jet of Mach No. 1.94 from a blowdown tunnel. (Author)

A82-28808 **Applications of structural adhesives in production.** W. J. Charles and S. J. Palmer (3M United Kingdom, Ltd., Adhesives, Coatings and Sealants Div., Swansea, Wales). In: Adhesion 5; Proceedings of the Eighteenth Annual Conference on Adhesion and Adhesives, London, England, March 1980. London, Applied Science Publishers, Ltd., 1981, p. 119-131.

A82-28826 **Instruments and installations for meteorological measurements at airports (Pribory i ustanovki dlia meteorologicheskikh izmerenii na aerodromakh).** Edited by L. P. Afinogenov and E. V. Romanov. Leningrad, Gidrometeoizdat, 1981. 296 p. In Russian.

A description is given of the systems and devices which are employed to provide the meteorological information which is needed for the conduction of the flight operations of civil aviation according to the established standards of safety, efficiency, and reliability, taking into account the meteorological conditions at the airport and its environment. Problems and organizational aspects concerning the conduction of meteorological measurements at airports are discussed, giving attention also to the accuracy requirements. The various approaches for determining visibility characteristics are examined along with the equipment employed in the measurements. The determination of wind parameters, atmospheric pressure, temperature, and humidity is also considered. A description is provided of an automatic system which was developed in 1971 for the utilization of automatic procedures in connection with the acquisition, the processing, and the distribution of meteorological data. G.R.

A82-28873 **Tool use in cutting operations involving integral structural components in aircraft construction (Werkzeugeinsatz bei der Zerspanung von Integralbauteilen im Flugzeugbau).** H. Grasmann (Messerschmitt-Bölkow-Blohm GmbH, Augsburg, West Germany). In: Cutting operations for metals (Zerspanung der Metalle). Oberursel, West Germany, Deutsche Gesellschaft für Metallkunde, 1981, p. 97-104. In German.

In connection with the desirability to use lighter and stiffer structural units in aircraft designs, integral constructional approaches have been adopted in the aircraft industry during the last few years. The change involves a replacement of a multitude of small individual sheet metal parts by a few complex integral structural components, which are obtained by suitable machining operations from forgings or plates. The materials used for the production of integral structural components include, in addition to aluminum, also titanium and high-strength steels. However, a number of problems arise in connection with the required metal-cutting operations. Problems related, in particular, to the use of titanium are solved by making use of a new cutting concept involving the use of multiple-spindle machines and special tools. Attention is given to the selection of suitable cutting tools. G.R.

A82-28875 1 **Cascade converter of dc voltage to ac voltage**

of higher frequency with voltage and frequency stabilization devices (Kaskadnyi preobrazovatel' postoiannogo napriazheniia v peremennoe povyshennoi chastoty s ustroistvami dlia stabilizatsii napriazheniia i chastoty). M. M. Krasnoshapka and I. P. Tereshkov (Vysshee Inzhenerno-Aviatsionnoe Voennoe Uchilishche VVS, Kiev, Ukrainian SSR). *Tekhnicheskaia Elektrodinamika*, Jan.-Feb. 1982, p. 59-62. In Russian.

A dc-to-ac cascade converter is presented which consists of a dc motor and an asynchronous motor with a three-phase stator winding and a multiphase rotor winding mounted on a common shaft within the same housing. The experimental converter changes 28 V dc to 200/115 V ac, 400 Hz; it has a power of 800 VA at 8000 rpm and an efficiency of 0.56. The voltage stabilization circuit includes a toroidal winding on the back of the stator, an automatic voltage regulator which controls the magnetization current of the toroidal winding, and a capacitor bank controlled by the magnetization current through a contactor. Frequency is stabilized by an automatic current regulator in the control field coil circuit. V.L.

A82-29932 A multidimensional-crack-growth prediction methodology for flaws originating at fastener holes. W. T. Fujimoto and C. R. Saff (McDonnell Aircraft Co., St. Louis, MO). (*Society for Experimental Stress Analysis, International Congress on Experimental Mechanics, 4th, Boston, MA, May 25-30, 1980*.) *Experimental Mechanics*, vol. 22, Apr. 1982, p. 139-146. 16 refs.

A general two-dimensional crack growth prediction methodology for flawed fastener holes is developed which accounts for the effects of residual stresses due to yielding at the hole edge as well as the changing shape of the flaw. The methodology is based on a slice-synthesis model of the flawed hole which predicts the stress-intensity factor distribution along the periphery of the crack after each increment of advance. Analytic predictions of crack growth rates are found to be in good agreement with test results. It is concluded that the assumption of a constant shape in one-dimensional crack growth prediction schemes can result in highly inaccurate service life estimates. V.L.

A82-29934 Utility of a probability-density-function curve and F-maps in composite-material inspection. J. L. Rose, Y. H. Jeong, and M. J. Avioli (Drexel University, Philadelphia, PA). *Experimental Mechanics*, vol. 22, Apr. 1982, p. 155-160.

The principles of probability-density-function analysis are briefly reviewed and its applications to nondestructive testing are discussed with emphasis on composite materials inspection. It is shown that probability-density-function curves can be used to produce feature maps (F-maps) of a composite material which are useful in both quality control and damage assessment. Sample problems involving graphite-polyimide structures and boron-aluminum materials are examined to illustrate the use of probability-density-function curves and F-maps. The concept of inspectability and its role in selecting a manufacturing technology are also discussed. V.L.

A82-[illegible] # Prediction of aerodynamically induced vibrations in turbomachinery blading. D. Hoyniak and S. Fleeter (Purdue University, West Lafayette, IN). In: Fluid/structure interactions in turbomachinery; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 1-8. 14 refs.

To predict the aerodynamically forced response of an airfoil, an energy balance between the unsteady aerodynamic work and the energy dissipated through the airfoil structural and aerodynamic damping is performed. Theoretical zero incidence unsteady aerodynamic coefficients are then utilized in conjunction with this energy balance technique to predict the effects of reduced frequency, inlet Mach number, cascade geometry, and interblade phase angle on the torsion mode aerodynamically forced response of the cascade. In addition, experimental unsteady aerodynamic gust data for flat plate and cambered cascaded airfoils are used together with theoretical cascade unsteady aerodynamic damping coefficients to indicate the effects of incidence angle and airfoil camber on the forced response of the airfoil cascade. (Author)

A82-[illegible] * # Measurement of aerodynamic work during fan flutter. A. P. Kurkov (NASA, Lewis Research Center, Cleveland, OH). In: Fluid/structure interactions in turbomachinery; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 9-16. 12 refs. (Previously announced in STAR as N81-[illegible])

A82-[illegible] # The excitation of compressor/duct systems. H. E. Peacock (U.S. Naval Postgraduate School, Monterey, CA) and D. K. Das (Cranfield Institute of Technology, Cranfield, Beds., England). In: Fluid/structure interactions in turbomachinery; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 71-78. 8 refs. Research sponsored by the Ministry of Defence of England.

A series of experiments is reported in which the flow through a compressor/duct combination was perturbed in a cyclic way. The unsteady flows generated were mapped through the system in the regime of stable compressor operations and the variation of their magnitude evaluated. It was found that in approaching the stability limit the stagnation pressure pulses tended to be magnified and that the position of the stability limit line depended both upon the mean operating point of the compressor and the pulsation characteristics. Further, it was possible to destabilize the system in a surge type manner at any superimposed frequency. (Author)

A82-[illegible] Advanced aluminum and titanium structures; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. Meeting sponsored by the American Society of Mechanical Engineers. Edited by J. W. Goodman (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). New York, American Society of Mechanical Engineers (Aerospace Symposia Series. Volume AD-02), 1981. 47 p. Members, $7.50; nonmembers, $15.

Among the topics discussed are the use of the spot weldbonding process in A-10 aircraft production, the structural integrity of an adhesively bonded aircraft fuselage, and the superplastic forming of 7475 aluminum alloy high-strength aircraft structures. Also considered are the development of low-cost titanium alloy structures using blended elemental powder metallurgy, and the techniques of built-up, low-cost advanced titanium alloy aircraft structure manufacture. O.C.

A82-[illegible] # Production weldbonding on the A-10 aircraft. R. L. Rupp, A. Sharpe (Fairchild Republic Co., Farmingdale, NY), and S. G. Lee (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Advanced aluminum and titanium structures; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 1-10. 8 refs. Contract No. F33615-78-C-5121.

The weldbonding process - an energy conservative manufacturing process where the detail parts are fixtured by spotwelding through a structural adhesive with subsequent curing to obtain the strength and fatigue life characteristic of adhesive bonded structure - has been production implemented on the A-10. A four-phase program has been conducted to provide near-term service experience and production experience on the A-10 and to define weldbond applicability to fatigue and fracture critical primary aircraft structure and secondary structure by mechanical property and environmental durability testing. The production costs for the first 100 weldbonded shipsets are discussed with an analysis of the key cost drivers. Planned production is in excess of 2800 weldbond assemblies. (Author)

A82-[illegible] # Structural integrity of an adhesively bonded aircraft fuselage. D. L. Potter (Douglas Aircraft Co., Long Beach, CA). In: Advanced aluminum and titanium structures; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 11-17. 11 refs. USAF-sponsored research.

Procedures and test results used in the selection of a surface pretreatment and adhesive system, and methods for its nondestructive inspection, are described for the case of the Primary Adhesively Bonded Structure Technology (PABST) program. PABST is concerned with evaluating the potential cost savings, weight reductions and structural integrity improvements that may result from the

New York, American Institute of Aeronautics and Astronautics, 1982, p. 387-396. 5 refs. (AIAA 82-0719)

In this paper, the problem of the shape optimization in a fiber reinforced composite has been considered. The shape optimization can be interpreted as the problem of the optimum fiber distribution. In particular, the design of a long cylindrical rod that is subjected to torsion has been discussed. The problem has been formulated as a dual or min-max problem with appropriate constraints. The resulting Lagrange multipliers have been identified with physical parameters by performing the needed variations. The design procedure has been discussed by considering the examples of the torsion of a rod of a circular, a square and a rectangular cross section. (Author)

A82-30171 * # **Transonic flutter study of a wind-tunnel model of a supercritical wing with/without winglet.** C. L. Ruhlin (NASA, Langley Research Center, Loads and Aeroelasticity Div., Hampton, VA), F. J. Rauch, Jr., and C. Waters (Grumman Aerospace Corp., Engineering Dept., Bethpage, NY). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 407-415. 18 refs. (AIAA 82-0721)

The scaled flutter model was a 1/6.5-size, semispan version of a supercritical wing (SCW) proposed for an executive-jet-transport airplane. The model was tested cantilever-mounted with a normal wingtip, a wingtip with winglet, and a normal wingtip ballasted to simulate the winglet mass properties. Flutter and aerodynamic data were acquired at Mach numbers from 0.6 to 0.95. The measured transonic flutter speed boundary for each wingtip configuration had roughly the same shape with a minimum flutter speed near M = 0.82. The winglet addition and wingtip mass ballast decreased the wing flutter speed by about 7 and 5%, respectively; thus, the winglet effect on flutter was more a mass effect than an aerodynamic effect. Flutter characteristics calculated using a doublet-lattice analysis (which included interference effects) were in good agreement with the experimental results up to M = 0.82. Comparisons of measured static aerodynamic data with predicted data indicated that the model was aerodynamically representative of the airplane SCW. (Author)

A82-30172 # **Aeroelastic flutter and divergence of stiffness coupled, graphite/epoxy, cantilevered plates.** S. J. Hollowell (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and J. Dugundji (MIT, Cambridge, MA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 416-426. 17 refs. Contract No. F33615-77-C-5155. (AIAA 82-0722)

An analytical and experimental investigation was conducted to determine the aeroelastic flutter and divergence behavior of unswept, rectangular wings simulated by graphite/epoxy, cantilevered plates with varying amounts of bending-torsion stiffness coupling. The analytical approach incorporated a Rayleigh-Ritz energy formulation and unsteady, incompressible two-dimensional aerodynamic theory. Flutter and divergence velocities were obtained using the V-g method and compared to results of low-speed wind tunnel tests. Stall flutter behavior was also examined experimentally. There was good agreement between analytical and experimental results. Wings with negative stiffness coupling exhibited divergence, while positive coupling delayed the onset of stall flutter. (Author)

A82-30173 # **Application of optimal control techniques to aircraft flutter suppression and load alleviation.** C. Hwang and W. S. Pi (Northrop Corp., Aircraft Div., Hawthorne, CA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 427-438. 14 refs. Contract No. F33615-80-C-3217. (AIAA 82-0724)

Optimal control techniques were applied to design the reduced order controllers for the purpose of aircraft flutter suppression and load alleviation. Special attention was given to the multiple input, multiple output (MIMO) system, to which the classical feedback control theory cannot be conveniently applied. Using the optimal control approach, a number of control laws were designed for the YF-17 flutter suppression model. The relative performances of these control laws and previously synthesized control laws were evaluated analytically. In a wind tunnel entry using the flutter suppression model, one of the newly developed control laws was mechanized and successfully demonstrated. (Author)

A82-30176 # **Flutter analysis using nonlinear aerodynamic forces.** T. Udea and E. H. Dowell (Princeton University, Princeton, NJ). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 462-481. 11 refs. Grant No. AF-AFOSR-81-0123. (AIAA 82-0728)

The nonlinear effects of transonic aerodynamic forces on the flutter boundary of a typical section airfoil are studied. The flutter speed dependence on amplitude is obtained by utilizing a novel variation of the describing function method which takes into account the first fundamental harmonic of the nonlinear oscillatory motion. By using an aerodynamic describing function, traditional flutter analysis methods may still be used while including the effects of aerodynamic nonlinearities. The aerodynamic forces are computed by the LTRAN2 aerodynamic code for NACA 64A006 and NACA 64A010 airfoils. (Author)

A82-30177 # **Feedback control of a cantilever wing in steady airflow.** L. Meirovitch and L. Silverberg (Virginia Polytechnic Institute and State University, Blacksburg, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 482-488. (AIAA 82-0729)

A method for the active flutter suppression of a cantilever wing in steady airflow is presented. The wing undergoes bending and torsional vibrations. The control forces are generated by leading-edge or trailing-edge flaps. Only the flutter modes are targetted for control, while the remaining modes are left uncontrolled. Because of inherent structural damping in the wing, however, motion in these modes decays exponentially with time. A numerical example is presented. (Author)

A82-30179 # **Component coupling with time-invariant mass matrix for nonisotropic rotating and nonrotating systems.** S. G. Sadler, J. Corrigan, and J. G. Yen (Bell Helicopter Textron, Fort Worth, TX). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 503-513. 13 refs. (AIAA 82-0731)

A method has been developed which allows a nonisotropic rotating structure to be coupled with a nonisotropic nonrotating structure such that the system's coupled equations of motion have a time-invariant mass matrix. The modeling requirements for this method are defined and the analytical approach is developed using physical degrees of freedom to describe the motions of both the rotating and the nonrotating components. Extensions to component modal synthesis methods are given for a typical component modal method, and also for a more recently developed method which retains only physical degrees of freedom at the component interfaces. The method is developed for both time-domain and frequency-domain solutions. Demonstration of the method for helicopter coupled rotor/airframe dynamic analysis including a two-bladed teetering rotor are presented. (Author)

A82-30182 * # **On the dynamic collapse of a column impacting a rigid surface.** J. M. Housner and N. F. Knight, Jr. (NASA, Langley Research Center, Structures and Dynamics Div., Hampton, VA). In: Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1982, p. 530-541. 24 refs. (AIAA 82-0735)

Results are presented of an analytical investigation on the dynamic collapse of an elastic periodically supported column. The column has an attached mass at one end and impacts a rigid surface with prescribed velocity and angle of incidence at the other end. A first-order approximate nonlinear analysis is developed in which it is assumed that only first-order nonlinear terms need be retained.

Differential equations are derived and solved numerically by explicit time integration in order to determine specific ranges of the basic nondimensional parameters for which the response characteristics are markedly different. To assess modeling sophistication relative to prediction accuracy, a comparison is made of the results from this approximate analysis with those of a finite element computer code based on a convected coordinate formulation. C.D.

A82-30193 * # **Subsonic aerodynamic and flutter characteristics of several wings calculated by the SOUSSA P1.1 panel method.** E. C. Yates, Jr., H. J. Cunningham, R. N. Desmarais (NASA, Langley Research Center, Hampton, VA), W. A. Silva, and B. Drobenko. *AIAA, ASME, ASCE, and AHS, Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, AIAA Paper 82-0727.* 20 p. 20 refs.

Several applications of the steady, oscillatory, and unsteady subsonic and supersonic aerodynamics (SOUSSA) computer program to wings with steady and oscillatory motion, including flutter, are discussed. The program employs a generalized Green's function to the full, time-dependent potential-flow equation to obtain an integral equation for the velocity potential at any point in a flow, even points on a body or whole bodies in a flow. Aerodynamic calculations are provided for two rectangular wings, a clipped-tip delta wing, and two swept wings with and without a fuselage. The number and distribution of the finite element panels are varied in order to demonstrate the convergence of the results. The results are shown to be close to those of lifting-surface theory, and further applications with bodies having deformities, arbitrary shapes, motions, and deformations are indicated. M.S.K.

A82-30294 **A giant step toward composite helicopters.** M. M. Schwartz and G. Jacaruso (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Machinist,* Mar. 1982, p. 133-140.

The design goals and performance achievements of the UH60A Black Hawk helicopter Composite Rear Fuselage (CRF) structure's development are described, with emphasis on the use of computer-assisted interactive design techniques and on the fabrication and assembly methods used to produce this graphite-reinforced epoxy structure, which is 6 ft high, 8 ft wide, and 9 ft long. The metallic form of the rear fuselage is composed of 1203 parts, divided into 88 assemblies, with 17,000 fasteners. By contrast, the CRF comprises 459 detail parts, 23 assemblies and less than 6000 fasteners. Weight savings of 10% and manufacturing cost reductions of 30% have been demonstrated. Attention is given to the cutting and kitting of prepreg details, their preforming and pre-layup, frame and bulkhead fabrication, and the fabrication of the upper-center skin assembly. O.C.

A82-30311 **Improvements to secondary radar for air traffic control.** R. C. Bowes (Royal Signals and Radar Establishment, Malvern, Worcs., England). *Journal of Navigation,* vol. 35, May 1982, p. 193-204. Research supported by the Civil Aviation Authority.

The civil use of secondary surveillance radar (SSR), which is the prime sensor for the control of the aircraft, is described. The use of SSR in air-traffic control is detailed, and comparisons with primary radar are made. The prevention of sidelobe interrogations and the processing of SSR replies are explained. The two main types of problems with SSR, self-interference effects and reflected signals, are discussed. Additional topics of discussion are monopulse direction finding, which enables an accurate azimuth measurement to be obtained from a single reply, and selective address SSR, which helps solve the SSR garble problem. C.D.

A82-30312 **The reliability of height and identity data.** H. Gent (Royal Signals and Radar Establishment, Malvern, Worcs., England). *Journal of Navigation,* vol. 35, May 1982, p. 204-219. Research sponsored by the Civil Aviation Authority.

The nature and extent of secondary surveillance radar (SSR) errors are discussed with a description of the Mode A and Mode C codes, and a concrete example of error is given. Investigation shows that short-period Mode C and Mode A errors are equally likely, each occurring in about 1 plot in 5000, with neither airborne nor ground equipment being wholly responsible. Pulse error counts are made for both modes, and a comparison with garble shows that while the latter occurs more frequently, it can be anticipated while data errors cannot. Examples of persistent as opposed to short-period errors are also discussed, with the two types for Mode C showing very similar behavior. The airborne equipment was found to be at fault in all errors that cannot be explained as simple pulse code errors. The introduction of Mode S will reduce the incidence of data errors. C.D.

A82-30313 **Secondary radar for airborne collision avoidance.** S. Ratcliffe. *Journal of Navigation,* vol. 35, May 1982, p. 220-239. 14 refs.

Cooperative collision avoidance systems, passive beacon collision avoidance systems (BCAS), and active radar systems are discussed for civil aviation. The detection of collision risk is treated mathematically. The trajectory of a possible threat as plotted in the range/range rate phase plane is discussed, and the range/range-rate logic is quantitatively studied. Parameters are given for the sensitivity levels at which BCAS is operative. The use of height and height-rate data is described, and the operation of the collision avoidance system is analyzed. Finally, the resolution advisory register, which ensures compatibility between BCAS advisories, is discussed. C.D.

A82-30314 **Magnetic anomalies as a reference for ground-speed and map-matching navigation.** C. Tyren. *Journal of Navigation,* vol. 35, May 1982, p. 242-254.

The use of the earth's magnetic field for ground referenced motion and position measurements is discussed. A magnetic terrain-navigation concept is set forth, and its sensor configuration, data processing and data storage unit, and navigation data interface unit are discussed. The navigational accuracy of the system is assessed; one particular advantage of terrain navigation systems is that ground-speed accuracy is independent of vehicle speed until speeds are reached at which the sensors and/or computer operations are too slow to track the vehicle path. The system is therefore excellent at low speeds and can advantageously be used for hovering operations. The results of field tests indicate that the feasibility of both ground-speed and map-matching methods is indeed promising. C.D.

A82-30675 **Aviation gear drives and reducers: Handbook (Aviatsionnye zubchatye peredachi i reduktory: Spravochnik).** Edited by E. B. Vulgakov. Moscow, Izdatel'stvo Mashinostroenie, 1981. 376 p. In Russian.

The book contains data on the geometry, kinematics, design, manufacture, and testing of aviation gear drives and reducers. In particular, consideration is given to the geometrical analysis of involute cylindrical gear drives, gear drive strength and dynamics, splined joints, analysis of torsional and flexural vibrations, and computer-aided design of gear drives. Other topics discussed include materials, chemical and heat treatment, tolerances, and quality assurance during the manufacture of gears, experimental testing techniques, and principal defects. Attention is also given to the design of helicopter reduction gears, overrunning clutches, lubricants for reduction gears, and cost-effectiveness of gear manufacture. V.L.

A82-30697 † **Gas turbine engines used in aviation: Design and construction of components /5th revised and enlarged edition/ (Aviatsionnye gazoturbinnye dvigateli: Konstruktsiia i raschet detalei /5th revised and enlarged edition/).** G. S. Skubachevskii. Moscow, Izdatel'stvo Mashinostroenie, 1981. 552 p. 113 refs. In Russian.

The principles underlying the design of gas turbine engines are expounded. The operating conditions of the various engine compartments, and parts thereof, are considered. Attention is also given to manufacturing processes and the proper choice of materials. Examples of calculations for determining the strength and vibration of the principal engine components are included. C.R.

A82-31048 **Chem-Braze abradable seal practical.** M. Levy (U.S. Army, Army Materials and Mechanics Research Center, Watertown, MA). *ManTech Journal,* vol. 6, no. 2, 1981, p. 9-12. Army-supported research.

An improved Chem-Braze bonding system for attaching sintered abradable seals to titanium, steel, and nickel base compressor blade tip shrouds has been developed. The system incorporates glycerin to prevent premature evaporation which prolongs working life and allows adequate time to attach abradable seals to engine hardware. The system has demonstrated its viability with attachment involving simple mechanical fixturing and curing and removal facilitiated by chemical stripping, and all operations are relatively fast and filtering system is recommended. A protocol of tests intended to determine acceptable performance of the system is presented. Author (ESA)

N82-22260# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Helicopter Div.

CONTROLS AND DISPLAYS FOR ALL-WEATHER OPERATION OF HELICOPTERS

R. D. vonReth 3 Apr. 1981 19 p refs
(MBB-UD-319-81-O) Avail: NTIS HC A02/MF A01

Various mission requirements for all weather operations are reviewed. In particular some of the most important features for military applications are outlined. Some of the basic relations between increasing display sophistication and increasing control sophistication are discussed. Also the influence of various functions on the degree of control automation as it seems desirable for future systems under the aspect of man machine interaction are taken into consideration. The controls and displays arrangement of some representative helicopters of presently operational helicopters are described. An outline of the goals and results of some experimental and research programs is given. The characteristics of presently operational helicopters are compared with the technologically feasible solutions taking into account some of the economic constraints as initial cost, operational cost and reliability. In an outlook at the future some basic requirements for the controls and the displays operation are established. J.M.S.

N82-22262*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THE ROLE OF MODERN CONTROL THEORY IN THE DESIGN OF CONTROLS FOR AIRCRAFT TURBINE ENGINES

J. Zeller, B. Lehtinen, and W. Merrill 1982 17 p refs Presented at 12th Aerospace Sci. Conf., Orlando, Fla., 11-14 Jan. 1982; sponsored by AIAA
(NASA-TM-82815; E-1162; NAS 1.15:82815) Avail: NTIS HC A02/MF A01 CSCL 21E

Accomplishments in applying Modern Control Theory to the design of controls for advanced aircraft turbine engines were reviewed. The results of successful research programs are discussed. Ongoing programs as well as planned or recommended future thrusts are also discussed. Author

N82-22263*# Cessna Aircraft Co., Wichita, Kans. Pawnee Div.

ADVANCED GENERAL AVIATION COMPARATIVE ENGINE/AIRFRAME INTEGRATION STUDY Final Report, Jan. 1980 - Sep. 1981

George L. Huggins and David R. Ellis Sep. 1981 133 p refs
(Contract NAS3-22221)
(NASA-CR-165564; NAS 1.26:165564; Cessna-AD-217) Avail: NTIS HC A07/MF A01 CSCL 21E

The NASA Advanced Aviation Comparative Engine/Airframe Integration Study was initiated to help determine which of four promising concepts for new general aviation engines for the 1990's should be considered for further research funding. The engine concepts included rotary, diesel, spark ignition, and turboprop powerplants; a conventional state-of-the-art piston engine was used as a baseline for the comparison. Computer simulations of the performance of single and twin engine pressurized aircraft designs were used to determine how the various characteristics of each engine interacted in the design process. Comparisons were made of how each engine performed relative to the others when integrated into an airframe and required to fly a transportation mission. Author

N82-22264*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.

ENERGY EFFICIENT ENGINE EXHAUST MIXER MODEL TECHNOLOGY

H. Kozlowski and M. Larkin Jun. 1981 186 p refs
(Contract NAS3-20646)
(NASA-CR-165459; NAS 1.26:165459; PWA-5594-164) Avail: NTIS HC A09/MF A01 CSCL 21E

An exhaust mixer test program was conducted to define the technology required for the Energy Efficient Engine Program. The model configurations of 1/10 scale were tested in two phases. A parametric study of mixer design options, the impact of residual low pressure turbine swirl, and integration of the mixer with the structural pylon of the nacelle were investigated. The improvement of the mixer itself was also studied. Nozzle performance characteristics were obtained along with exit profiles and oil smear photographs. The sensitivity of nozzle performance to tailpipe length, lobe number, mixer penetration, and mixer modifications like scalloping and cutbacks were established. Residual turbine swirl was found detrimental to exhaust system performance and the low pressure turbine system for Energy Efficient Engine was designed so that no swirl would enter the mixer. The impact of mixer/plug gap was also established, along with importance of scalloping, cutbacks, hoods, and plug angles on high penetration mixers. M.D.K.

N82-22266*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.

ADVANCED LOW-EMISSIONS CATALYTIC-COMBUSTOR PROGRAM, PHASE 1 Final Report

G. J. Sturgess Jun. 1981 158 p refs
(Contract NAS3-20821)
(NASA-CR-159656; NAS 1.26:159656; PWA-5589-19; ESL-TR-79-23) Avail: NTIS HC A08/MF A01 CSCL 21E

Six catalytic combustor concepts were defined, analyzed, and evaluated. Major design considerations included low emissions, performance, safety, durability, installations, operations and development. On the basis of these considerations the two most promising concepts were selected. Refined analysis and preliminary design work was conducted on these two concepts. The selected concepts were required to fit within the combustor chamber dimensions of the reference engine. This is achieved by using a dump diffuser discharging into a plenum chamber between the compressor discharge and the turbine inlet, with the combustors overlaying the prediffuser and the rear of the compressor. To enhance maintainability, the outer combustor case for each concept is designed to translate forward for accessibility to the catalytic reactor, liners and high pressure turbine area. The catalytic reactor is self-contained with air-cooled canning on a resilient mounting. Both selected concepts employed integrated engine-starting approaches to raise the catalytic reactor up to operating conditions. Advanced liner schemes are used to minimize required cooling air. The two selected concepts respectively employ fuel-rich initial thermal reaction followed by rapid quench and subsequent fuel-lean catalytic reaction of carbon monoxide, and, fuel-lean thermal reaction of some fuel in a continuously operating pilot combustor with fuel-lean catalytic reaction of remaining fuel in a radially-staged main combustor. Author

N82-22267*# United Technologies Research Center, East Hartford, Conn.

INVESTIGATION OF SOOT AND CARBON FORMATION IN SMALL GAS TURBINE COMBUSTORS Final Report

T. J. Rosfjord Apr. 1982 54 p refs
(Contract NAS3-22524)
(NASA-CR-167853; NAS 1.26:167853; UTRC-R82-915387-16) Avail: NTIS HC A04/MF A01 CSCL 21E

An investigation of hardware configurations which attempt to minimize carbon and soot-production without sacrificing performance in small gas turbine combustors was conducted. Four fuel injectors, employing either airblast atomization, pressure atomization, or fuel vaporization techniques were combined with nozzle air swirlers and injector sheaths. Eight configurations were screened at sea-level takeoff and idle test conditions. Selected configurations were focused upon in an attempt to quantify the influence of combustor pressure, inlet temperature, primary zone operation, and combustor loading on soot and carbon formation. Cycle tests were also performed. It was found that smoke emission levels depended on the combustor fluid mechanics, the atomization quality of the injector and the fuel hydrogen content. R.J.F.

N82-22268*# Beech Aircraft Corp., Wichita, Kans.

ADVANCED GENERAL AVIATION ENGINE/AIRFRAME INTEGRATION STUDY

Leon A. Zmroczek Mar. 1982 131 p refs
(Contract NAS3-22220)
(NASA-CR-165565; NAS 1.26:165565) Avail: NTIS HC A07/MF A01 CSCL 21E

A comparison of the in-airframe performance and efficiency of the advanced engine concepts is presented. The results indicate that the proposed advanced engines can significantly improve the performance and economy of general aviation airplanes. The engine found to be most promising is the highly advanced version of a rotary combustion (Wankel) engine. The low weight and fuel consumption of this engine, as well as its small size, make it suited for aircraft use. T.M.

N82-22269*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PERFORMANCE OF SINGLE-STAGE AXIAL-FLOW TRANSONIC COMPRESSOR WITH ROTOR AND STATOR ASPECT RATIOS OF 1.63 AND 1.77, RESPECTIVELY, AND WITH DESIGN PRESSURE RATIO OF 2.05

Royce D. Moore and Lonnie Reid Apr. 1982 115 p refs
(NASA-TP-2001; E-334; NAS 1.60:2001) Avail: NTIS HC A06/MF A01 CSCL 21E

The overall and blade-element performance of a transonic compressor stage is presented over the stable operating range for speeds from 50 to 100 percent of design. The stage was designed for a pressure ratio of 2.05 at a flow of 20.2 kg/sec and a tip speed of 455 m/sec. At design speed the rotor and stage achieved peak efficiencies of 0.849 and 0.831, respectively, at the minimum flow condition. The stage stall point occurred at a flow higher than the design flow. Author

N82-22270# Rolls-Royce Ltd., Derby (England).

RB211 POWERPLANT DETERIORATION: REVIEW OF CURRENT SITUATION AND LESSONS LEARNED

Alec G. Collins 1981 5 p
(PNR-90073) Avail: NTIS HC A02/MF A01

The need for high temperatures in the engine cycle of gas turbine aircraft engines was demonstrated; the effects of thermal barrier coatings (TBC) on component life, cooling air requirements, and turbine entry temperature (TET) are discussed. Experience with the RB211, Olympus 593, and Pegasus engines illustrates the usefulness of TBCs consisting of zirconia based ceramics with nickel or cobalt bond coats. Life improvements > 50% are directly attributable to TBCs on combustor walls, vaporizing fuel injectors, and discharge nozzles. Airfoil coatings survive 150 hr RB211-524 tests at higher than normal TET. Author (ESA)

N82-22271# Rolls-Royce Ltd., Derby (England).

THE CONTRIBUTION OF THERMAL BARRIER COATINGS TO IMPROVEMENTS IN THE LIFE AND PERFORMANCE OF GAS TURBINE COMPONENTS

S. J. Hartropp, D. A. Marsh, and G. W. Meetham 1981 11 p
(PNR-90076) Avail: NTIS HC A02/MF A01

Ceramic coatings significantly increase the lives of components in high temperature environments by insulating metal substrates from a hot gas stream. The need for high temperatures in gas turbine engines, and the opportunities for and requirements from thermal barrier coatings are covered. Bench and service engine evaluation and analysis of tested parts from which the features of successful coating systems were derived, are presented. Author (ESA)

N82-22272# Rolls-Royce Ltd., Derby (England).

DEVELOPMENT OF A CORRELATED FINITE ELEMENT DYNAMIC MODEL OF A COMPLETE AERO ENGINE

R. A. Bellamy, J. C. Bennett, and S. T. Elston 1981 10 p refs
(PNR-90081) Copyright. Avail: NTIS HC A02/MF A01

The accuracy of the dynamic model of the RB211 engine and nacelle was tested. Modal descriptions of load/deflection behavior, natural frequencies, and mode shapes were compared with shake tests and modal analyses. Modal analysis was carried out by a frequency response analyzer which used an incremental sine technique and a minicomputer based system that input a random signal to the shaker, operating on transducer measurements with a software Fourier transform in order to achieve the frequency response functions. Correlation between the results is excellent. Author (ESA)

N82-22273# Societe Nationale Industrielle Aerospatiale, Marignane (France.) Helicopter Div.

PARAMETRIC STUDY OF THE INFLUENCE OF THE ENGINE UPON THE OPERATING COST OF A CIVIL HELICOPTER

Gilbert Baclac, Jean-Pierre Dedieu, and Philippe Cabrit Paris 1981 6 p Presented at 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DFVLR, Cologne
(SNIAS-827-210-102) Avail: NTIS HC A02/MF A01

The influence of engine characteristics (weight, fuel consumption, price, power range) upon helicopter operating cost was studied. The parametric relationship between gross weight, weight of airframe with one or two turbine engines, engine weight, and fuel weight was defined. An 860 hp engine was made more powerful by increasing turbine inlet temperature through the cooling of the high pressure turbine and by increasing pressure ratio. Analysis shows that a sufficient power reserve is necessary, but too high a value penalizes operating cost. This confirms the interest of having a super emergency rating on civil helicopter engines. Low fuel consumption should be the result of a compromise with level of complexity since high complexity increases the engine cost and can reduce reliability. Simultaneous evolution of aircraft and engine increases cost effectiveness. Author (ESA)

N82-22274# Rolls-Royce Ltd., Derby (England).

ENCOUNTERS WITH SURGE: SOME EXPERIENCES OF DEVELOPMENT OF AXIAL COMPRESSORS FOR AERO GAS TURBINES

A. B. McKenzie Mar. 1981 35 p
(PNR-90071) Avail: NTIS HC A03/MF A01

Rolls Royce jet engine development is traced. The Avon was the first. Its design pressure ratio is 6.15, corresponding to a design temperature rise of 20 C per stage in each of 12 stages. The first stage entry diameter ratio is 0.5, lower than contemporary compressors. In the Avon RA14, surge, precipitated when a number of stages stalled, was eliminated by progressively increasing the stagger of the last six rotor blade rows by 1 deg to 6 deg. In the Conway, a bypass provides a permanent bleed from the low pressure compressor. The bleed becomes an increasing proportion of total flow as speed is reduced. This eliminates surge problems when the engine is throttled back at high forward speed. In the Tyne, the removal of the hub section permits a higher surge pressure ratio. In the RB211, a handling bleed with a variable input is placed between the compressors. Author (ESA)

N82-22275# Rolls-Royce Ltd., Derby (England).

RELIABLE POWER

J. M. S. Keen Feb. 1981 21 p Presented at Intern. Aircraft Maintenance Eng. Exhibition and Conf., Zurich, Feb. 1981
(PNR-90078) Avail: NTIS HC A02/MF A01

The Rolls Royce RB211 engine design is reviewed. The three shaft concept increases engine thrust and cuts fuel consumption. The highest thrust version of the RB211 cuts fuel consumption of Boeing 747's by 17%. The 535E4 blends turbine and bypass flows in a buried nozzle within a longer cowl. The resultant gases are exhausted through a single final nozzle. This device provides an automatic rematching of the engine cycle at climb ratings, thereby saving fuel and reducing turbine entry temperature. Reverse thrust is increased by up to 30% relative to an unmixed engine. The on-condition maintenance policy reduces costs without reducing safety. The reliability management program ensures the most cost effective maintenance schedule. Author (ESA)

N82-22276# Rolls-Royce Ltd., Derby (England).

FUEL EFFICIENCY ENGINES FOR LARGE TRANSPORT AIRCRAFT

D. J. Parfitt 27 Mar. 1981 27 p Presented at Aeron. Soc. of India Conf., Bombay, 27 Mar. 1981
(PNR-90082; MISC-555) Avail: NTIS HC A03/MF A01

The next generation of Rolls Royce aircraft engines is discussed, especially their fuel consumption. For the RB211, improvements on the order of 10% in fuel consumption relative to the initial service standard are planned. Large fan engines are expected to remain technology leaders in the long-term. Fuel savings on the order of 10% to 15% are feasible, using low specific thrust designs. Noise and exhaust emission improvements are predicted. Advanced wing designs and the use of lightweight composite materials, linked with full authority digital control systems, enhance engine performance. Liquid hydrogen is suggested as a replacement for kerosene, because of its high heating value. Author (ESA)

N82-22277# Rolls-Royce Ltd., Derby (England).

COLLABORATIVE DEVELOPMENT OF AERO-ENGINES

G. M. Lewis 1981 9 p
(PNR-90083) Avail: NTIS HC A02/MF A01

European cooperation in aircraft engine development is described, using the Olympus and RB199 projects as examples. The management structure was based on the integration of existing teams in the partner companies. Author (ESA) tion into the flow, in diameters, was almost unaltered until 'hard' impingement occurred. In modeling impinging cases, a 'plume redirection' term was introduced which is apparently absent in previous models. The effects of this term were found to be very significant. Author

N82-23236*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

COMPARISON OF ANALYTICAL PREDICTIONS OF LONGITUDINAL SHORT PERIOD PILOT-INDUCED OSCILLATIONS WITH RESULTS FROM A SIMULATION STUDY OF THE SPACE SHUTTLE ORBITER

Donald R. Riley and G. Kimball Miller, Jr. Apr. 1982 43 p refs
(NASA-TM-83267; L-14847; NAS 1.15:83267) Avail: NTIS HC A03/MF A01 CSCL 01C

An analytical analysis of conditions producing pilot induced oscillations (PIO's) was made for the space shuttle orbiter in a landing approach configuration for the task of milling the elevation angle of the line of sight to a target vehicle. The analysis yielded a value of PIO frequency and a value for the amount of total system time delay (pilot + control system) that can be tolerated before instability results. Calculations were performed showing the effect of varying the range to the target and of varying the handling qualities of the orbiter vehicle. Analytical predictions were compared with simulation results obtained using a visual motion simulator. Author

N82-23237*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

VALIDATION OF ZERO-ORDER FEEDBACK STRATEGIES FOR MEDIUM RANGE AIR-TO-AIR INTERCEPTION IN A HORIZONTAL PLANE

Josef Shinar Apr. 1982 48 p refs
(NASA-TM-84237; NAS 1.15:84237; A-8895) Avail: NTIS HC A03/MF A01 CSCL 01C

A zero order feedback solution of a variable speed interception game between two aircraft in the horizontal plane, obtained by using the method of forced singular perturbation (FSP), is compared with the exact open loop solution. The comparison indicates that for initial distances of separation larger than eight turning radii of the evader, the accuracy of the feedback approximation is better than one percent. The result validates the zero order FSP approximation for medium range air combat analysis. S.L.

N82-23238*# North Carolina State Univ., Raleigh. Dept. of Mechanical and Aerospace Engineering.

AUTOMATED DESIGN OF MINIMUM DRAG LIGHT AIRCRAFT FUSELAGES AND NACELLES Final Report

Frederick O. Smetana, Star R. Fox, and Baruch E. Karlin 14 May 1982 25 p refs
(Grant NsG-1584)
(NASA-CR-168913; NAS 1.26:168913) Avail: NTIS HC A02/MF A01 CSCL 01C

The constrained minimization algorithm of Vanderplaats is applied to the problem of designing minimum drag faired bodies such as fuselages and nacelles. Body drag is computed by a variation of the Hess-Smith code. This variation includes a boundary layer computation. The encased payload provides arbitrary geometric constraints, specified a priori by the designer, below which the fairing cannot shrink. The optimization may include engine cooling air flows entering and exhausting through specific port locations on the body. M.D.K.

N82-23239*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

TRANSONIC FLUTTER STUDY OF A WIND-TUNNEL MODEL OF A SUPERCRITICAL WING WITH/WITHOUT WINGLET

Charles L. Ruhlin, Frank J. Rauch, Jr., and Catherine Waters Mar. 1982 11 p refs Presented at the 23rd AIAA/ASME/ASCE/AHS Struct., Structural Dyn. and Mater. Conf., New Orlean, 10-12 May 1982 Prepared in cooperation with Grumman Aerospace Corp., Bethpage, N.Y.
(NASA-TM-83279; NAS 1.15:83279) Avail: NTIS HC A02/MF A01 CSCL 01C

The model was a 1/6.5-size, semipan version of a wing proposed for an executive-jet-transport airplane. The model was tested with a normal wingtip, a wingtip with winglet, and a normal wingtip ballasted to simulate the winglet mass properties. Flutter and aerodynamic data were acquired at Mach numbers (M) from 0.6 to 0.95. The measured transonic flutter speed boundary for each wingtip configuration had roughly the same shape with a minimum flutter speed near M = 0.82. The winglet addition and wingtip mass ballast decreased the wing flutter speed by about 7 and 5 percent, respectively; thus, the winglet effect on flutter was more a mass effect than an aerodynamic effect. T.M.

N82-23240*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EVALUATION OF FOUR SUBCRITICAL RESPONSE METHODS FOR ON-LINE PREDICTION FLUTTER ONSET IN WIND-TUNNEL TESTS

Charles L. Ruhlin, Judith J. Watson, Rodney H. Ricketts, and Robert V. Doggett, Jr. Mar. 1982 10 p refs Presented at the AIAA/ASME/ASCE/AHS 23rd Struct., Structural Dyn. and Mater. Conf., New Orleans, 10-12 May 1982
(NASA-TM-83278; NAS 1.15:83278;
AIAA-PAPER-82-0644CP) Avail: NTIS HC A02/MF A01 CSCL 01C

The methods were evaluated for use in tests where the flutter model is excited solely by airstream turbulence. The methods were: randomdec, power-spectral-density, peak-hold, and cross-spectrum. The test procedure was to maintain a constant Mach number (M) and increase the dynamic pressure (q) in incremental steps. The test Mach numbers were 0.65, 0.75, 0.82, 0.90, and 1.15. The four methods provided damping trends by which the flutter mode could be tracked and extrapolated to a flutter-onset q. A hard flutter point was obtained at M = 0.82. The peak-hold and cross-spectrum methods gave reliable results and could be most readily used for on-line testing. At M = 0.82, a p-k analysis predicted the same flutter mode as the experiment but a 6-percent lower flutter q. At the subcritical dynamic pressures, calculated damping values were appreciably lower than measured data. T.M.

N82-23241*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOP. VOLUME 5: PROPULSION SESSION

1980 [illegible]1 p Workshop held at Palo Alto, Calif., 3-5 Dec. 1980
(NASA-TM-84207; NAS 1.15:84207) Avail: NTIS HC A10/MF A01 CSCL 01C

The expressed needs and priorities of the civil helicopter users, the existing research efforts, and technology requirements as perceived by leading airframe and engine manufacturers were addressed, compared, and evaluated. Specifically, the observations and conclusions of these areas as they relate to the helicopter propulsion system are reported. Author

N82-23242*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOP. VOLUME 6: VEHICLE CONFIGURATION SESSION

1980 256 p Workshop held at Palo Alto, Calif., 2-5 Dec. 1980
(NASA-TM-84180; NAS 1.15:84180) Avail: NTIS HC A12/MF A01 CSCL 01C

Five high speed rotorcraft configurations are considered: the high speed helicopter, compound helicopter, ABC, tilt rotor and the X wing. The technology requirements and the recommended actions are discussed. S.L.

N82-23243*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

NASA/HAA ADVANCED ROTORCRAFT TECHNOLOGY AND TILT ROTOR WORKSHOP. VOLUME 7: TILT ROTOR SESSION

1980 37 p Workshop held at Palo Alto, Calif., 2-5 Dec. 1980
(NASA-TM-84705; NAS 1.15:84705) Avail: NTIS HC A03/MF A01 CSCL 01C

The technical characteristics of the XV-15 aircraft were discussed. Program objectives, concept evaluation, tilt rotor experiments and civil market applications are presented. The XV-15 status and test schedule are also included. S.L.

N82-23244*# National Aeronautics and Space Administration.

Langley Research Center, Hampton, Va.
PLANAR EQUATIONS OF ROLLOUT MOTION FOR AN AIRCRAFT WITH FREE OR STEERABLE LANDING GEARS
Robert K. Sleeper and Eunice G. Smith May 1982 54 p refs
(NASA-TP-1984; L-11669; NAS 1.60:1984) Avail: NTIS HC A04/MF A01 CSCL 01C

Equations were derived for an aircraft in a three-point attitude. Transient tire forces were simulated by delaying the application of forces derived from steady-state considerations. Predicted rollout trajectories were similar to those measured in tests of a small-scale landing-gear model equipped with pneumatic tires (where a laterally sloping runway was used to simulate a crosswind), both with and without nose-wheel steering. T.M.

N82-23245*# Kansas Univ. Center for Research, Inc., Lawrence.
DEVELOPMENT OF A SIMPLE, SELF-CONTAINED FLIGHT TEST DATA ACQUISITION SYSTEM Progress Report
Robert Clarke, Douglas Shane, Jan Roskam, and Dale I. Rummer
Apr. 1982 250 p refs
(Grant NsG-4019)
(NASA-CR-168912; NAS 1.26:168912; KU-FRL-407-7) Avail: NTIS HC A11/MF A01 CSCL 14B

The flight test system described combines state-of-the-art microprocessor technology and high accuracy instrumentation with parameter identification technology which minimize data and flight time requirements. The system was designed to avoid permanent modifications of the test airplane and allow quick installation. It is capable of longitudinal and lateral-directional stability and control derivative estimation. Details of this system, calibration and flight test procedures, and the results of the Cessna 172 flight test program are presented. The system proved easy to install, simple to operate, and capable of accurate estimation of stability and control parameters in the Cessna 172 flight tests. Author

N82-23246*# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.
COMPUTER MODELING OF FAN-EXIT-SPLITTER SPACING EFFECTS ON F100 RESPONSE TO DISTORTION Final Report
M. Shaw and R. W. Murdoch Mar. 1982 115 p refs
(Contract NAS3-22739)
(NASA-CR-167879; NAS 1.26:167879; FR-15596) Avail: NTIS HC A06/MF A01 CSCL 21E

The distortion response of the F100(3) engine was effected by the fan exit splitter configuration. The sensitivity for a proximate splitter fan is calculated to be slightly greater than a remote splitter configuration with identical airfoils. Predicted response was based upon a multiple segment parallel compressor Model modified to include a bypass ratio representation that effects the performance characteristics of the last rotor and intermediate case struts. The predicted distortion response required an accurate definition of row pre- and post-stall undistorted operation. Author

N82-23247*# Notre Dame Univ., Ind. Dept. of Electrical Engineering.
ALTERNATIVES FOR JET ENGINE CONTROL Technical Progress Report, 1 Oct. 1980 - 30 Sep. 1981
Michael K. Sain 1981 140 p refs
(Grant NsG-3048)
(NASA-CR-168894; NAS 1.26:168894; TPR-12) Avail: NTIS HC A07/MF A01 CSCL 21E

Research centered on basic topics in the modeling and feedback control of nonlinear dynamical systems is reported. Of special interest were the following topics: (1) the role of series descriptions, especially insofar as they relate to questions of scheduling, in the control of gas turbine engines; (2) the use of algebraic tensor theory as a technique for parameterizing such descriptions; (3) the relationship between tensor methodology and other parts of the nonlinear literature; (4) the improvement of interactive methods for parameter selection within a tensor viewpoint; and (5) study of feedback gain representation as a counterpart to these modeling and parameterization ideas. Author

N82-23248*# Pratt and Whitney Aircraft Group, East Hartford, Conn.
ANALYSIS OF HIGH LOAD DAMPERS Final Report
S. T. Bhat, D. F. Buono, and D. H. Hibner 21 Aug. 1981 79 p refs
(Contract NAS3-22518)
(NASA-CR-165503; NAS 1.26:165503; PWA-5779-10) Avail: NTIS HC A05/MF A01 CSCL 21E

High load damping requirements for modern jet engines are discussed. The design of damping systems which could satisfy these requirements is also discussed. In order to evaluate high load damping requirements, engines in three major classes were studied: large transport engines, small general aviation engines, and military engines. Four damper concepts applicable to these engines were evaluated: multi-ring, cartridge, curved beam, and viscous/friction. The most promising damper concept was selected for each engine and performance was assessed relative to conventional dampers and in light of projected damping requirements for advanced jet engines. S.W.

N82-23249*# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.
ADVANCED TURBINE STUDY Final Report, Aug. 1980 - Dec. 1981
12 Apr. 1982 94 p
(Contract NAS8-33821)
(NASA-CR-162003; NAS 1.26:162003; FR-15978) Avail: NTIS HC A05/MF A01 CSCL 21E

Experiments to determine the available increase in turbine horsepower achieved by increasing turbine inlet temperature over a range of 1800 to 2800 R, while applying current gas turbine airfoil cling technology are discussed. Four cases of rocket turbine operating conditions were investigated. Two of the cases used O2/H2 propellant, one with a fuel flowrate of 160 pps, the other 80 pps. Two cases used O2/CH4 propellant, each having different fuel flowrates, pressure ratios, and inlet pressures. Film cooling was found to be the required scheme for these rocket turbine applications because of the high heat flux environments. Conventional convective or impingement cooling, used in jet engines, is inadequate in a rocket turbine environment because of the resulting high temperature gradients in the airfoil wall, causing high strains and low cyclic life. The hydrogen-rich turbine environment experienced a loss, or no gain, in delivered horsepower as turbine inlet temperature was increased at constant airfoil life. The effects of film cooling with regard to reduced flow available for turbine work, dilution of mainstream gas temperature and cooling reentry losses, offset the relatively low specific work capability of hydrogen when increasing turbine inlet temperature over the 1800 to 2800 R range. However, the methane-rich environment experienced an increase in delivered horsepower as turbine inlet temperature was increased at constant airfoil life. The results of a materials survey and heat transfer and durability analysis are discussed. M.G.

N82-23250# Shaker Research Corp., Ballston Lake, N. Y.
BASIC TECHNOLOGY OF SQUEEZE-FILM DAMPERS FOR ROTOR DYNAMICS CONTROL Final Report, Jul. 1978 - Jul. 1981
C. H. T. Pan Nov. 1981 47 p refs
(Contract DAAG29-78-C-0027)
(AD-A110842; SRC-81-TR-74; ARO-15657.4-E) Avail: NTIS HC A03/MF A01 CSCL 21/5

Research was performed to develop a rigorous treatment for the film rupture process in the squeeze-film damper. The short bearing analysis was generalized to accommodate a consistent treatment of the rupture domain for a squeeze-film damper, which is undergoing a circular orbit motion either in a submerged condition or with one end subjected to a pressurized feed condition. GRA

N82-23252# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Kurzuebersicht fuer Information und Dokumentation.
ACTTA: INVESTIGATION OF NEW PILOTING AND FLIGHT CONTROL TECHNOLOGIES. VOLUME 1: REVIEW; ACTIVE WING Milestone Report on Phase 1, 1979 - 1980 [ACTTA: UNTERSUCHUNG NEUARTIGER STEUERUNGS- UND FLUGFUEHRUNGSTECHNOLOGIEN. MEILENSTEINBERICHT ZUR PHASE 1: 1979/1980. BAND 1: UEBERSICHT; AKTIVER FLUEGEL]
Walter Kolender and U. A. Fischer 23 Mar. 1981 192 p refs
In GERMAN 2 Vol.
(Contract BMFT-LFK-7960-8)
(MBB-UH-05-81-Vol-1) Avail: NTIS HC A09/MF A01

Flight control technologies were investigated as to their realizability and economy. The conceptual phase of project Active Wing is presented. Investigation methodology, calculation

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[AIAA 82-0705] A82-30096

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[NASA-CR-166313] N82-22250
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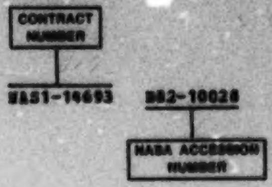

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application of recently developed environment-resistant, 250 F-cure modified epoxy adhesives and their primers. NDI-detected adhesive flaws in the full-scale demonstration component structure, destructively exposed after completion of the test program, showed precise correlation with the Fokker Bondtester Model 70. It is also found that metal crack propagation is contained within the stiffened boundaries of pressurized panels. The damage tolerance and durability of bonded primary structures are shown to be superior to those of mechanically-fastened structures despite the fabrication quality latitude permitted by the PABST program. O.C.

A82-28997 # **SPF of high strength aluminum structures.** F. T. McQuilkin (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA), C. H. Hamilton (Rockwell International Science Center, Thousand Oaks, CA), and J. Waldman (U.S. Army, Research and Development Command, Dover, NJ). In: Advanced aluminum and titanium structures; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 19-25.

The aluminum alloy 7475 has been shown to exhibit excellent superplastic properties upon thermomechanical processing, allowing the one-step production of complex structures otherwise realizable only through the use of many parts and fasteners. After reviewing the results of tests characterizing elongation as a function of temperature and strain rate, and corresponding measurements of flow stress as a function of strain rate, over the temperature range of 371-516 C, the strain rate sensitivity exponent was determined as a function of temperature strain rate for the selection of optimum forming parameters. The 7475 alloy was then applied to the production of a redesigned T-39 Saberliner forward fuselage bulkhead consisting of a single, complex-formed sheet with four small clips, by contrast to 18 parts and over 100 rivets in conventional form, demonstrating a 36% cost reduction and 22% weight saving. O.C.

A82-28998 # **Development of low-cost titanium structures using blended elemental powder metallurgy.** P. C. Eloff (Imperial Clevite Technology Center, Cleveland, OH). In: Advanced aluminum and titanium structures; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 27-31. Research supported by Gould, Inc., United Technologies Corp., and Magnavox Government and Industrial Electronics Co.

By using blends of titanium sponge fine powder and elemental or masteralloy powders, powder metallurgy techniques have demonstrated a halving of materials costs by comparison with conventional wrought titanium alloy hardware production. An additional advantage of powder metallurgy in the working of the titanium alloy family in question, which is difficult to machine, is the ability to produce near-net shapes requiring little subsequent machining. The two structural components by which these capabilities are demonstrated are a compressor-stator connecting link for the F-100 turbofan engine, and a warhead body for the Army Stinger ground-to-air missile. The alloy compositions used are Ti-6Al-4V and Ti-6Al-6V-2Sn, respectively. It is suggested that it may be possible to formulate alloys through powder blending which would not be obtainable by means of conventional ingot metallurgy. O.C.

A82-29000 # **Advanced technology DFCS control panel for the L-1011-500.** T. E. Foster (Rockwell International Corp., Collins Air Transport Div., Cedar Rapids, IA). *American Institute of Aeronautics and Astronautics and Institute of Electrical and Electronics Engineers, Digital Avionics Systems Conference, 4th, St. Louis, MO, Nov. 17-19, 1981, AIAA Paper 81-2240.* 8 p.

The design features and development are described of a digital glareshield panel for the digital FCS-240 system that achieves the following design objectives: (1) an efficient interface with the digital FCC's; (2) improved mean time between failures; (3) required aircraft wiring; (4) improved monitoring and fault isolation features; (5) accommodation of new operational features; (6) increased flexibility for configuration changes. Besides providing traditional functions, the panel contains these advanced technology features: gas discharge displays, multifunctional displays, ARINC 429 interfaces, microprocessor control, dual redundant design, monitoring and fault isolation, human factor design, and growth and flexibility accommodation. C.D.

A82-29005 # **A Schwarz-Christoffel method for generating internal flow grids.** K. P. Sridhar (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT) and R. T. Davis (Cincinnati, University, Cincinnati, OH). In: Computers in flow predictions and fluid dynamics experiments; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 35-44. 17 refs.

A new coordinate generation technique, developed by Davis for external flows, is extended to allow for accurate grid generation for a variety of complex internal flow configurations. The approach is based on numerical integration of the Schwarz-Christoffel transformation for polygonal surfaces. It is shown to be second-order accurate with mesh size due to analytic treatment of boundary singularities. The method is flexible enough to allow for treatment of severe internal geometries, for a high degree of control of mesh spacing, and for generation of either orthogonal or nonorthogonal grids. In addition, this technique directly provides the two-dimensional incompressible potential flow solution for internal flows, as well as a simple expression for calculating the grid metric coefficients. Sample cases include symmetric and asymmetric channel, diffuser, and cascade flows. (Author)

A82-29008 * # **Application of computer generated color graphic techniques to the processing and display of three dimensional fluid dynamic data.** B. H. Anderson, C. W. Putt, and C. C. Giamati (NASA, Lewis Research Center, Cleveland, OH). In: Computers in flow predictions and fluid dynamics experiments; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 65-72. 12 refs.
(Previously announced in STAR as N81-29782)

A82-29016 # **A computer-controlled oscillation mechanism for unsteady aerodynamics experiments.** J. P. Retelle (U.S. Air Force Academy, Colorado Springs, CO), M. S. Francis (USAF, Office of Scientific Research, Bolling AFB, Washington, DC), and J. E. Keesee (USAF, Ballistic Missile Office, Norton AFB, CA). In: Computers in flow predictions and fluid dynamics experiments; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 213-218. 5 refs.

Numerous wind tunnel studies of airfoil dynamic stall have been limited to harmonic model oscillations, but new microcomputers and hybrid servo systems have now been exploited to produce a mechanism which provides a high degree of flexibility in achieving arbitrary model motions in multiple degrees of freedom over a wide range of motion alternatives. An apparatus capable of providing simultaneous motions of an airfoil or wing model in both pitch and translation has been designed and fabricated. Drive motors provide independent motion in two axes under control of servo-translator units which respond to pulse trains generated by a microcomputer using analog position and feedback loops to smooth the pulses. Programs are developed in a higher-level language using a larger disk-based computer system with subsequent downline loading of the program task image through a network communications link to the smaller computer. In addition to a description of the experimental apparatus, the various elements of motion control, including servo-translator dynamic characteristics, software techniques for pulse train generation, and required computer interface circuitry, are discussed. System performance characteristics are also discussed. (Author)

A82-29032 # **Fatigue behavior of adhesively bonded joints.** W. B. Jones, Jr. (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH) and J. Romanko (General Dynamics Corp., Fort Worth, TX). In: 1981 advances in aerospace structures and materials; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 61-65. 5 refs. Contract No. F33615-76-C-5220.

Adhesively bonded metal aircraft structural joints are multicomponent systems, and as such, may display complex fatigue behaviors over the range of loads and environments typically experienced in service. In order to explore the fatigue behavior of the adhesive layer itself, thick-adherend lap-shear joints were fabricated, stress analyzed, and tested. Stress distributions in the adhesive layer were calculated using a finite element program. Instrumented fatigue tests were conducted at several loads, frequencies, humidities and temperatures. Some of these tests were interrupted, and the metal had been chem milled away. Only specimens which had experienced unduly high load amplitudes displayed damage. The damage initiated in the (calculated) high stress regions as interface cracks with scrim plane crazing. The cracks grew, with concurrent reduction in joint stiffness, until cohesive failure occured in the scrim plane. The adhesive material tested is surprisingly tough and resistant to fatigue crack growth. (Author)

A82-29036 # Effects of moisture on the mechanical properties of glass/epoxy composites. C. D. Douglas and E. R. Pattie (U.S. Army, Army Materials and Mechanics Research Center, Watertown, MA). In: 1981 advances in aerospace structures and materials; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 91-97. 11 refs.

Data are presented showing the effects of moisture on the mechanical properties of a specific glass/epoxy composite system that is a candidate material for fabrication of Army composite helicopter rotor blades. The test specimens were immersed in distilled water at temperatures of 25, 40, 60, and 80 C. Immersion times were one week, one, two, three, six, and nine months, and one year. Tension testing was then done on an Instron floor-model machine at a contant crosshead speed of 0.127 cm/min, and the tangent modulus was determined. Specimen strength was found to decrease by 60 percent at 80 C immersion, less at lower temperatures. The modulus dropped about 50 percent at 80 C immersion for 90 deg off-axis specimens, less for those that were less off-axis. A coupling agent with high-fiber, low-resin content was found to be superior to other couplers. C.D.

A82-29042 # Turbulence-excited flapping motion of a rotor blade in hovering flight. Y. K. Lin (Illinois, University, Urbana, IL) and C. Y. R. Hong. In: 1981 advances in aerospace structures and materials; Proceedings of the Winter Annual Meeting, Washington, DC, November 15-20, 1981. New York, American Society of Mechanical Engineers, 1981, p. 149-153. 10 refs. Grant No. DAAG29-78-G-0039.

Statistical properties of a randomly vibrating rotor blade under the excitation of turbulence is investigated using a simple model which consists of a rigid blade, centrally hinged, with elastic restraint for the flapping motion. It is shown that turbulence affects the blade motion in two ways, distinguished by two types of terms in the equation of motion. The first type appears in the coefficients, thus causing the dynamic system to change randomly with time. The second type appears among the inhomogeneous terms. A theoretical procedure is proposed in which both effects of the turbulence can be accounted for. Application of the methodology is illustrated by numerical examples. (Author)

A82-29088 * Addition polyimide adhesives containing various end groups. A. K. Saint Clair and T. L. Saint Clair (NASA, Langley Research Center, Hampton, VA). *Polymer Engineering and Science*, vol. 22, no. 1, Jan. 1982, p. 9-14. 11 refs.

Addition polyimide oligomers have been synthesized from 3,3 prime, 4,4 prime-benzophenone tetracarboxylic acid dianhydride and 3,3 prime-methylenedianiline using a variety of latent crosslinking groups as end-caps. The nominal 1300 molecular weight imide prepolymers were isolated and characterized for solubility in amide, chlorinated and ether solvents, melt-flow and cure properties, glass transition temperature, and thermal stability on heating in an air atmosphere. Adhesive strengths of the polyimides were obtained both at ambient and elevated temperatures before and after aging at 232 C. Properties of the novel addition polyimides were compared to a known nadic end-capped adhesive, LARC-13. (Author)

A82-29185 * Comparing the relationships between noise level and annoyance in different surveys - A railway noise vs. aircraft and road traffic comparison. J. M. Fields (NASA, Langley Research Center, Hampton, VA; Southampton, University, Southampton, England) and J. G. Walker (Southampton University, Southampton, England). *Journal of Sound and Vibration*, vol. 81, Mar. 8, 1982, p. 51-80. 24 refs. Research supported by the British Railways Board; Science Research Council of England Grant No. B/RG/3777/3.

Annoyance expressed in a railway noise survey is compared with that from two road traffic and three aircraft surveys in order to determine whether responses to various types of environmental noise are source-specific. Railway noise is found to be less annoying than other noises at any given high noise level. Railway noise annoyance rises less rapidly with increasing noise level. At high levels, this gap in reactions averages about 10 dB; it ranges from 4 dB to more than 20 dB. The methods used for comparing the surveys are examined. It is found that methodological uncertainties lead to imprecise comparisons and that different annoyance scales yield different estimates of intersurvey differences. C.R.

A82-29254 Low cost aircrew training devices. M. A. G. Knight (RAF Support Command, Brampton, Cumb., England). *Aeronautical Journal*, vol. 86, Mar. 1982, p. 96-101. 5 refs.

A description is presented of the simple aids that may be used in the elementary stages of aircrew training, and illustrations are given of their integration with flight simulators and aircraft to constitute a systematic approach to flight training. The techniques described include books and manuals, two-dimensional trainers, cardboard cockpits, cutaway trainers, table top trainers, cockpit procedures and instruments trainers, computer-based trainers, videogames and video discs. Attention is given to computer-assisted instruction, in which a microcomputer assumes many of the functions of an instructor and a low-cost graphics terminal takes the role of a more complex and dynamic simulator display. O.C.

A82-29255 The micro revolution comes to civil air transport. M. Ryland (British Airways, Heathrow Airport, Middx., England). *Aeronautical Journal*, vol. 86, Mar. 1982, p. 102-108.

A presentation is made of the range of microprocessor applications currently available on civil aircraft, the hardware technology on which these applications are based is reviewed, and the software disciplines and certification procedures pertinent to airborne digital computers are outlined. Attention is given to the application of microcomputer-based systems in the B 767 new-generation airliner, which include flight control computers, flight management computer systems, CRT flight instrumentation, thrust management, air data computation, supervisory engine control, radio navigation and communication equipment control, and electrical generation regulation. It is shown that most problems encountered in applying microcomputers to civil aircraft are software-related. O.C.

A82-29368 A review of U.S. Air Force research related to airframe and engine materials. A. H. Rosenstein (USAF, Office of Scientific Research, Bolling AFB, Washington, DC). *Journal of Metals*, vol. 34, Mar. 1982, p. 14-23. 18 refs. USAF-sponsored research.

It is noted that the research addresses the fundamental physical nature of solids most directly relating to mechanical and thermal behavior. This involves an understanding of strengthening mechanisms, fatigue, plasticity, creep, fracture, shock loading, the effect of stress state, the kinetics of phase transformations, lattice imperfections, and the thermal dependence of properties. An important result of this research is information that will lead to improved structural alloys of aluminum, titanium, and nickel and to a thorough understanding of the scientific principles governing their properties and behavior. C.R.

A82-29375 The investigation of aircraft accidents and incidents - Some recent national and international developments. A. van Wijk (KLM Royal Dutch Airlines, Schiphol Airport, Netherlands). *Zeitschrift fur Luft- und Weltraumrecht*, vol. 31, Mar. 1982, p. 29-65. 75 refs.

In June 1981, an International Civil Aviation Organization (ICAO) Panel of Experts on the General Work Programme of the ICAO Legal Committee recommended that the subject 'Legal Implications of Aircraft Accident and Incident Investigation' deserved consideration as a possible new item to be added to the General Programme of the Legal Committee and that a [illegible] inexpensive. Optimum inhibitor concentration was found to be 10 percent. Optimum drying time, cure cycle, proper chemical stripping technique, and inexpensive tooling techniques were also determined. A preliminary cost analysis shows a 74 percent saving compared to attachment with gold-nickel braze. C.D.

A82-31057 **Aircraft cabin air ozone contamination and compliance with regulations.** J. F. Leach, G. R. Robinson (British Aerospace Public Ltd., Co., Filton, Avon, England), and F. J. Sandalls (Atomic Energy Research Establishment, Environmental and Medical Sciences Div., Didcot, Oxon, England). *Atmospheric Environment,* vol. 16, no. 5, 1982, p. 1021-1026. 9 refs. Research supported by the Department of Transport/Department of the Environment and Department of Industry.

Fifteen cabin air ozone measurements made in Concorde are ranked in order and plotted as log-normal and extreme value cumulative probability distributions. It is shown that the log-normal distribution gives adequate accuracy for regulatory purposes and one-sided tolerance limits may be used for statistical methods of compliance with any regulatory limit. Similarly it is shown that compliance by ozone destruction ratio may be difficult due to the extreme stratification of ozone in the lower stratosphere. (Author)

A82-31121 # **Optimal control and estimation for strapdown seeker guidance of tactical missiles.** P. L. Vergez and J. R. McClendon (USAF, Armament Laboratory, Eglin AFB, FL). *Journal of Guidance, Control, and Dynamics,* vol. 5, May-June 1982, p. 225, 226.

An extended Kalman filter is developed that explicitly accounts for the major error sources in a strapdown system and estimates the state information required by an advanced guidance system. The selected guidance law is derived from linear quadratic Gaussian theory, the only assumption being that the missile has instantaneous response and complete control over its acceleration. The filter processes the noise from the strapdown seeker and estimates the information needed by the guidance law referenced to the missile's body-fixed coordinate system. A detailed six-degree-of-freedom simulation of a generic bank-to-turn short range air-to-air missile was used to evaluate the guidance and estimation algorithm developed for the study. C.D.

A82-31125 * # **Comment on 'Optimal control via mathematical programming'.** L. J. Wood (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *Journal of Guidance, Control, and Dynamics,* vol. 5, May-June 1982, p. 318, 319; Authors' Reply, p. 319. 16 refs. Contract No. NAS7-100.

A82-31179 **Combat training imagery.** *Flight International,* vol. 121, Apr. 24, 1982, p. 1048-1050.

The CT-5 is a computer-generated image (CGI) using raster scan that provides a daylight system design for sophisticated military applications. The imagery includes a formation of F-16s, a CH-46 helicopter, a KC-135, and a sea data-base. Backgrounds are realistically depicted. The CT-5 uses a PDP-11 general-purpose minicomputer connected to the simulator computer and image processor, which consists of the viewpoint processor and the channel processor. There is also a series of display processors, and scanline computation is replaced by area computation. Extra channels and more display processors can be added. C.D.

A82-31290 **The helicopter Navstar GPS test program.** R. D. Till (FAA, Technical Center, Washington, DC). *Vertiflite,* vol. 28, May-June 1982, p. 22-25.

The use of the Navstar Global Positioning System (GPS) for helicopter navigation is reviewed. The GPS system has a space segment with a contingent of 18-24 satellites in 12 hr circular orbits with 2 hr coverage by four satellites over selected areas, a user segment with a receiver/processer, and a control segment composed of four monitor stations. Ephemeris data on satellite location is relayed through the control segments to a Master Control station at Vandenberg AFB. The use of four satellites involves the solution of four equations for three-dimensional requirements and for the user clock bias. Civilian use is thus far limited to a coarse/acquisition code at a signal level of -133 dB. A total of 17 flight hours of tests with civilian craft have been flown to test the system, with the helicopter tests covering the total system cross track error, the flight technical error, and the along track error. Operational status is scheduled for 1984. M.S.K.

A82-31426 # **New materials fly better and cheaper.** *Mechanical Engineering,* vol. 104, May 1982, p. 20-26.

The types of advanced, high-performance fibers and their advantages are described, and the process of forming composites is outlined. The use of composites in present and future commercial and military aircraft, including the Learfan 2100 and the Space Shuttle Discovery, is discussed. Special attention is given to metallic and ceramic materials of the future. C.D.

A82-31602 † **The maximum flying range problem for an aircraft (O zadache poleta letatel'nogo apparata na maksimal'nuiu dal'nost').** V. I. Borzov and T. R. Igonina. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Tverdogo Tela,* Mar.-Apr. 1982, p. 20-24. 5 refs. In Russian.

The maximum flying range problem is examined in terms of the motion of the center of mass of an aircraft in a vertical plane. By using methods based on the theory of differential equations with singular perturbations, the maximum flying range problem is reduced to that of solving a boundary-value problem. The applicability of the proposed model is investigated, and the particular case of the maximum flying range in gliding is examined. V.L.

A82-31603 † **Stability and self-oscillations of coaxial rotors (Ob ustoichivosti i avtokolebaniiakh soosnykh rotorov).** E. L. Pozniak. *Akademiia Nauk SSSR, Izvestiia, Mikhanika Tverdogo Tela,* Mar.-Apr. 1982, p. 38-45. 9 refs. In Russian.

An analysis is presented of the stability and stable self-oscillations induced by viscosity-type nonconservative forces in the material of the shaft in a system of two coaxial rotors supported by a rigid damped frame. The range of stability is studied as a function of the rotor velocities and directions and as a function of damping in the bearings of the frame. A quasi-Galerkin method is used to determine frequencies, amplitudes, and modes for single-frequency as well as multifrequency self-oscillations. The stability of the obtained solutions is investigated. B.J.

A82-31643 † **Effect of operating life on the mechanical properties of the materials and load-bearing capacity of the rotor elements of gas-turbine engines (Vliianie ekspluatatsionnoi narabotki na mekhanicheskie svoistva materialov i nesushchuiu sposobnost' elementov rotorov GTD).** V. L. Akhremenko (Akademiia Nauk Ukrainskoi SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR). *Problemy Prochnosti,* Apr. 1982, p. 53-55. 5 refs. In Russian.

Experiments have been conducted to investigate changes in the mechanical properties of turbine alloys EI698, EI961, EI437BUVD, and AL4 following long-term service under actual operating conditions. It is found that ductility and impact toughness are most sensitive to damage, whereas the load-bearing capacity of gas-turbine rotors changes insignificantly in the course of service life and, therefore, cannot be used as a damage criterion. V.L.

A82-31669 **Distributed airborne array concepts.** B. D. Steinberg (Pennsylvania, University, Philadelphia, PA) and E. Yadin (Interspec, Inc., Philadelphia, PA). *IEEE Transactions on Aerospace and Electronic Systems,* vol. AES-18, Mar. 1982, p. 219-227. 19 refs. Grant No. AF-AFOSR-78-3688.

The improvement in SNR and detection range due to distributing an antenna array throughout the airframe and skin of an aircraft is examined. SNR formulas for three system configurations are presented and compared with that of a conventional, monostatic radar. Examples given in the paper show detection range increases as large as a factor of 4. Three additional potential advantages of the distributed array are an increase in spatial signal processing capability, an improvement in azimuthal resolution, and a potential reduction in transmitter power for fixed radar performance so as to reduce the probability of intercept. (Author)

STAR ENTRIES

N82-22144# Royal Aircraft Establishment, Farnborough (England).

THE ROYAL AIRCRAFT ESTABLISHMENT: 100 YEARS OF RESEARCH

A. J. Smith 2 Oct. 1981 33 p refs Presented at 1981 Aviation Lighting Sem., Williamsburg, Virginia, 9-13 Nov., 1981; sponsored by Illuminating Engineering Society of North America (RAE-TM-FS-432; BR80894) Copyright. Avail: NTIS HC A03/MF A01

The work of the Royal Aircraft Establishment (RAE) from its days as His Majesty's Balloon factory to modern times is summarized. Early setbacks to aircraft production included the 1909 War Office declaration that the airplane had no military value. The First World War changed this opinion and the interwar years saw an expansion which bore fruit in the development of the gyro gun sight, stabilized bomb sight and high speed aerial reconnaissance during World War 2. The tapered ladder effect used in airfield approach lighting systems was developed after the war, along with subsonic and supersonic wind tunnels. Recent projects involving the RAE include Concorde, Earth resources satellites, and head-up displays. Author (ESA)

N82-22145# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

LA RECHERCHE AEROSPATIALE, BI-MONTHLY BULLETIN NUMBER 1981-5, SEPTEMBER - OCTOBER 1981

Claude Sevestre, ed. ESA Feb. 1982 63 p refs Transl. into ENGLISH of La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-5, Sep. - Oct. 1981 Sponsored by ESA (ESA-TT-725) Avail: NTIS HC A04/MF A01; original report in FRENCH available at ONERA, Paris FF 45

Advances in aerospace engineering are reviewed. Flow theory and computation are considered. Signal processing algorithms are presented. Structural analysis of composite materials is discussed. Two wind tunnel investigations, helicopter rotor performance measurement and testing a digital filtering system, are also described.

N82-22151# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

HELICOPTER ROTOR PERFORMANCE IMPROVEMENT BY UTILIZATION OF SWEPT-BACK PARABOLIC BLADE TIP

J. J. Philippe and P. Lafon *In its* La Rech. Aerospatiale, Bi-monthly Bull. No. 1981-5, Sep. - Oct. 1981 (ESA-TT-725) Feb. 1982 p 55-56 refs Transl. into ENGLISH of La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-5, Sep. - Oct. 1981

Avail: NTIS HC A04/MF A01; original report in FRENCH available at ONERA, Paris FF 45

A sweptback parabolic tip was designed so as to improve the working conditions of an advancing blade by reducing the intensity of the shock waves which arise and the drag associated with such shocks. The design is based on the computated pressure distribution on a helicopter blade in the fundamental case of a nonlifting rotor. The results of the computations clearly show the advantages of using this geometry for a rotor blade tip. Results of tests on such tips, performed in a wind tunnel on a three bladed rotor, demonstrate an overall improvement in the performance of the rotor. Author (ESA)

N82-22152# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

REAL TIME DIGITAL FILTERING TEST IN THE S1 CONTINUOUS WIND TUNNEL AT MODANE

J. Appel *In its* La Rech. Aerospatiale, Bi-monthly Bull. No. 1981-5, Sep. - Oct. 1981 (ESA-TT-725) Feb. 1982 p 57-61 ref Transl. into ENGLISH of La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1981-5, Sep. - Oct. 1981 Avail: NTIS HC A04/MF A01; original report in FRENCH available at ONERA, Paris FF 45

A set of real time digital filters was used in a wind tunnel during testing of a transport aircraft model. The performance of the digital filters, programmed at various cutoff frequencies, was compared with that of analog filters already in use. Ten measuring channels, permitting computation of three aerodynamic coefficients for the model, were recorded. The operating principle of the real time digital filters is described. Results confirm the interest of low pass filtering at a very low cutoff frequency for restoring static parameters while a model is performing an angle of attack sweep in continuous mode. Author (ESA)

N82-22153# National Aerospace Lab., Amsterdam (Netherlands). Div. of Structures and Materials.

REVIEW OF AERONAUTICAL FATIGUE INVESTIGATIONS IN THE NETHERLANDS, MARCH 1979 - FEBRUARY 1981

J. B. deJonge Feb. 1981 43 p refs Presented at the 17th ICAF Conf., Noordwijkerhout, Netherlands, 18-19 May 1981 (NLR-MP-81006-U) Avail: NTIS HC A03/MF A01

Reports on aeronautical fatigue investigations are reviewed. The reports are cited in a subject index, covering: loads; flight simulation testing, procedures and evaluation; fatigue investigations; prediction of crack initiation and crack propagation; damage tolerance and residual strength; materials evaluation; inspection methods and service failure analysis; fatigue of aircraft materials; fatigue of laminates; fatigue of joints; and prediction of residual strength of stiffened panels. Author (ESA)

N82-22154# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

DYNAMIC ENVIRONMENTAL QUALIFICATION TECHNIQUES

Dec. 1981 245 p refs Partly in ENGLISH; one in FRENCH Proceedings of the 53rd Meeting of the Structures and Mater. Panel, Noordwijkerhout, Netherlands, 27 Sep. - 2 Oct. 1981 (AGARD-CP-318; ISBN-92-835-0306-6) Avail: NTIS HC A11/MF A01

The state of the art of dynamic qualification techniques and test methods for military aircraft with external stores are reviewed, including consideration of the rationale and interpretation of existing standards. The determination of environmental inputs from various sources and their application to specific aircraft and store configurations, including helicopters, are covered. Presentations were also given on the development of vibration analysis techniques and the evaluation of possible improvements in prediction methods and establishment of criteria.

N82-22156# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Combined Environments Test Group.

DEVELOPMENT AND USE OF DYNAMIC QUALIFICATION STANDARDS FOR AIR FORCE STORES

Alan H. Burkhard and Otto F. Maurer *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 7 p refs see N82-22154 13-01) Avail: NTIS HC A11/MF A01

The cataloging and standardization act for the standardization of items, materials, and engineering practices in the defense industry is discussed. Formal procedures for generating, updating, and utilization of these documents are presented. The advantages of standardization leading to simplification of procurement, development, and production processes by fostering uniformity, direct comparability, interchangeability of standardized objects are outlined. The state of the art of test techniques and procedures are considered. E.A.K.

N82-22158# British Aerospace Aircraft Group, Preston (England). Specialist Functions, Stress Office.

QUALIFICATION OF EQUIPMENT FOR GUNFIRE INDUCED VIBRATION

A. Peacock *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 22 p refs Avail: NTIS HC A11/MF A01

A method to ensure that the Tornado MK1 aircraft equipment withstand gunfire induced vibrations is described. The derivation of test spectra from rig and aircraft measurements is explained. Test failures and in-service malfunctions are reviewed. A comparison with Mil specification is made. E.A.K.

N82-22278# Rolls-Royce Ltd., Derby (England).
MULTI-MISSION V/STOL WITH VECTORED THRUST ENGINES
W. J. Lewis and P. Simpkin 1981 10 p
(PNR-90086) Avail: NTIS HC A02/MF A01

The use of V / STOL aircraft in European conflicts is discussed. Conventional aircraft were assumed to be inoperative within 370 km of the main battle area because of the destruction of runways. Achievable bomb delivery rate of subsonic V/STOL aircraft, and available combat air patrol time and the number of aircraft required in order to maintain a standing patrol of supersonic aircraft were considered. If the Harrier concept is adapted, a single vectored thrust engine with plenum chamber burning on two front nozzles, and a single rear nozzle, then the V/STOL aircraft is well suited to supersonic and subsonic air superiority and strike roles. Author (ESA)

N82-22279# Rolls-Royce Ltd., Derby (England).
DIRECTIONAL SOLIDIFICATION: PROJECT B2 Final Report
C. Lecomte-Mertens, M. Lamberigts, and D. Coutsouradis May 1981 109 p refs Transl. into ENGLISH of Rept. no. TLT-00818A, Centre de Rech. Metal. (Belgium) Partly in ENGLISH and FRENCH
(PNR-90088; Trans-15572/TLT-00818A) Avail: NTIS HC A06/MF A01

Thermal fatigue of Mar-M-002 nickel alloy blades with an equiaxial or columnar (directional) structure, precision cast in the laboratory, was evaluated. Their thermal fatigue is compared with that of nickel alloy blades obtained elsewhere. Creep resistance of the Mar-M-002 structures was tested. The influence of chemical composition, grain orientation, microstructural fineness, the presence of carbides, and morphology was determined by metallography. Crack length is always greater in blades treated at 1100 C than in those treated at 1000 C. Blade geometry is the predominant factor in thermal fatigue. Crack resistance, in ascending order is: large solid blade (laboratory); small solid blade (outside supplier); small hollow blade (industrial). The metallographic structure is not a suitable criterion for differentiating between the thermal shock behavior of equaxial blades and that of columnar blades. Author (ESA)

N82-22280*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CONTROL LAW DESIGN TO MEET CONSTRAINTS USING SYNPAC-SYNTHESIS PACKAGE FOR ACTIVE CONTROLS
William M. Adams, Jr. and Sherwood H. Tiffany Jan. 1982 16 p refs Presented at the Joint Automatic Control Conf., Charlottesville, Va., 17-19 Jun. 1981
(NASA-TM-83264; NAS 1.15:83264) Avail: NTIS HC A02/MF A01 CSCL 01C

Major features of SYNPAC (Synthesis Package for Active Controls) are described. SYNPAC employs constrained optimization techniques which allow explicit inclusion of design criteria (constraints) in the control law design process. Interrelationships are indicated between this constrained optimization approach, classical and linear quadratic Gaussian design techniques. Results are presented that were obtained by applying SYNPAC to the design of a combined stability augmentation/gust load alleviation control law for the DAST ARW-2. Author

N82-22281*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN ANALYSIS OF A NONLINEAR INSTABILITY IN THE IMPLEMENTATION OF A VTOL CONTROL SYSTEM
Jeanine M. Weber Mar. 1982 65 p refs
(NASA-TM-84220; A-8840; NAS 1.15:84220) Avail: NTIS HC A04/MF A01 CSCL 01C

The contributions to nonlinear behavior and unstable response of the model following yaw control system of a VTOL aircraft during hover were determined. The system was designed as a state rate feedback implicit model follower that provided yaw rate command/heading hold capability and used combined full authority parallel and limited authority series servo actuators to generate an input to the yaw reaction control system of the aircraft. Both linear and nonlinear system models, as well as describing function linearization techniques were used to determine the influence on the control system instability of input magnitude and bandwidth, series servo authority, and system bandwidth. Results of the analysis describe stability boundaries as a function of these system design characteristics. A.R.H.

N82-22282# National Aerospace Lab., Tokyo (Japan).
EXPERIMENT ON ACTIVE FLUTTER SUPPRESSION OF A CANTILEVER WING
Takao Kikuchi and Hae Kyong Lee Dec. 1981 10 p refs In JAPANESE; ENGLISH summary
(NAL-TR-690; ISSN-0389-4010) Avail: NTIS HC A02/MF A01

An experiment on active flutter suppression of a cantilever wing with the control surface at the wing tip is described. The experiment was done in a low subsonic wind tunnel. The deflection of the wing was measured by strain gages located near the root of the wing. The aileron was driven by a servomotor. Comparison was made between the present and previous results. It is concluded that the coefficients of the control law may have a different effect on the stability of the two- and three-dimensional models. Author

N82-22284*# National Aeronautics and Space Administration, Washington, D. C.
STUDIES ON WIND TUNNEL STRAIGHTENERS
F. Schultz-Grunow and K. Wieghardt Mar. 1982 16 p refs Transl. into ENGLISH from Luftfahrtforschung (West Germany), v. 17, no. 3, 20 Mar. 1940 p 82-86 Transl. by Kanner (Leo) Associates, Redwood City, Calif. original doc. prep. by Kaiser-Wilhelm Inst. for Flow Research, Goettingen (West Germany)
(Contract NASw-3541)
(NASA-TM-76689; NAS 1.15:76689) Avail: NTIS HC A02/MF A01 CSCL 14B

Tests using small-scale straighteners are reported. The studies allowed conclusions on the most favorable depth relationships, flow conditions behind the straightener and on the drag. The ways an obliquely hitting airflow is deflected by a straightener are examined. In addition the flow drag was measured and the manner in which the individual air columns emanating from the holes unite to form a homogeneous speed field was investigated. N.W.

N82-22285# National Inst. for Aeronautics and Systems Technology, Pretoria (South Africa).
DESIGN OF DYNAMICALLY-SCALED, ASYMMETRICAL WIND TUNNEL MODELS
M. E. Beyers 6 Aug. 1981 18 p refs
(NIAST-78/18) Avail: NTIS HC A02/MF A01

Dynamically scaled models are used in aerodynamic studies, notably in aircraft/store or stage separation studies. Techniques were developed for the design of free flight models in three general categories: dynamic stability free flight models, high maneuverability models optimized for nonoscillatory motion studies, and dynamic separation models. Dynamic scaling with fully simulated mass asymmetries play an important part in each of the three categories, particularly when nonplanar motions are simulated. The method is implemented in a 'FORTRAN IV DSAM'. S.L.

N82-22286# Research Inst. of National Defence, Umea (Sweden). Huvudavdelning 4.
RADIAK SIMULATOR FOR AIRCRAFT INSTRUMENTS [RADIAKSIMULATOR FOER FLYGINDIKERING]
Goeran Hulten, Melker Nordstrand, and Thomas Ulvsand Jun. 1981 30 p ref In SWEDISH
(FOA-C-40136-A3) Avail: NTIS HC A03/MF A01

An intensimeter no. 23 was used to detect radiation from aircraft. A simulator which could be programmed to give different time controlled simulated lapses was added to the equipment. The missions programmed into the memory included indications along a road, over an area and spot indications. Testing was performed at the Army Helicopter school in Boden under realistic conditions. Results indicate that this type of simulation is useful in training aircraft indication personnel. M.D.K.

N82-22314*# Boeing Commercial Airplane Co., Seattle, Wash.
THE 737 GRAPHITE COMPOSITE FLIGHT SPOILER FLIGHT SERVICE EVALUATION Annual Report, May 1980 - Apr. 1981
Randy L. Coggeshall Feb. 1982 50 p refs
(Contract NAS1-11668)
(NASA-CR-165826; NAS 1.26:165826; D6-37330; AR-7) Avail: NTIS HC A03/MF A01 CSCL 11D

A flight service report was prepared which covers the flight service experience of 111 graphite epoxy spoilers on 737 transport aircraft and related ground based environmental exposure of graphite epoxy material specimens. Spoilers were installed on 28 aircraft representing seven major airlines operating throughout the world. Tests of removed spoilers after the seventh year of service continue to indicate modest changes in composite strength properties. Two spoilers were tested, one with 6 and one with 7 years of service, and both had residual strengths that fall within the original static strength scatter band. Both these units had typical service included discrepancies when tested. Based on visual, ultrasonic, and destructive inspection there continues to be no evidence of moisture migration into the honeycomb core and no core corrosion in the deployed units. M.D.K.

N82-22315*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DEVELOPMENT AND DEMONSTRATION OF MANUFACTURING PROCESSES FOR FABRICATING GRAPHITE/LARC 160 POLYIMIDE STRUCTURAL ELEMENTS Final Report
R. K. Frost, J. S. Jones, P. J. Dynes, and D. H. Wykes Dec. 1981 499 p refs
(Contract NAS1-15371)
(NASA-CR-165809; NAS 1.26:165809) Avail: NTIS HC A21/MF A01 CSCL 11D

The development and demonstration of manufacturing technologies for the structural application of Celion graphite/LARC-160 polyimide composite material is discussed. Process development and fabrication of demonstration components are discussed. Process development included establishing quality assurance of the basic composite material and processing, nondestructive inspection of fabricated components, developing processes for specific structural forms, and qualification of processes through mechanical testing. Demonstration components were fabricated. The demonstration components consisted of flat laminates, skin/stringer panels, honeycomb panels, chopped fiber compression moldings, and a technology demonstrator segment (TDS) representative of the space shuttle aft body flap. R.J.F.

N82-22316*# Lockheed-California Co., Burbank.
FLIGHT SERVICE EVALUATION OF KEVLAR-49 EPOXY COMPOSITE PANELS IN WIDE-BODIED COMMERCIAL TRANSPORT AIRCRAFT Annual Flight Service Report
Robert H. Stone Jan. 1982 58 p refs
(Contract NAS1-11621)
(NASA-CR-165841; NAS 1.26:165841) Avail: NTIS HC A04/MF A01 CSCL 11D

Kevlar-49 fairing panels, installed as flight service components on three L-1011's, were inspected after 8 years service. The fairings had accumulated a total of 62,000 hours, with one ship set having 20,850 hours service. Kevlar-49 components were found to be performing satisfactorily in service with no major problems. The only defects noted were minor impact damage, a few minor disbonds and a minor degree of fastener hole fraying and elongation. The service history to date indicates that Kevlar-49 epoxy composite materials have satisfactory service characteristics for use in aircraft secondary structures. R.J.F.

N82-22334# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Stuttgart (West Germany).
SERVICE LIFE INVESTIGATION OF A SAILPLANE WING OF CFRP CONSTRUCTION
C. Kensche 1981 33 p refs In GERMAN; ENGLISH summary Presented at 17th OSTIV Congr., Paderborn-Haxterberg, West Germany, 28 May - 6 Jun. 1981
Avail: NTIS HC A03/MF A01

A sailplane wing of CFRP design was investigated to guarantee a higher stress level and longer service life than with glass fiber reinforced plastics and to define admissible design for the glider industry. Fatigue tests were run according to a block program. The residual wing strength was also tested. Periodic measurements are used to observe stiffness behavior during simulated service life. No change in stiffness is observed during the tests. Stress enhancement of 400 N/sq mm is admissible which increases service life from 3000 to 6000 hr. Author (ESA)

N82-22348# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
CRITICAL METALS CONSERVATION, RECYCLING AND SUBSTITUTION
E. F. Bradley (Pratt and Whitney Aircraft) Jan. 1982 23 p Presented at the 53rd Meeting of the AGARD Struct. and Mater. Panel, Noordwijkerhout, Netherlands, 27 Sep. - 2 Oct. 1981
(AGARD-R-693; ISBN-92-835-1412-2) Avail: NTIS HC A02/MF A01

Critical metals are reviewed relative to their current importance to the aerospace industry. The roles of conservation, recycling, substitution, stockpiling and market place operations are analyzed. Technologies are discussed relative to their effects on the critical metals, and finally, suggestions are presented for meeting material supply problems. S.L.

[illegible]# Rolls-Royce Ltd., Derby (England).
POWDER METALLURGICAL INNOVATIONS FOR IMPROVED HOT SECTION ALLOYS IN AERO-ENGINE APPLICATIONS
P. Wildgoose, N. G. Turner, H. F. Davies, B. J. Helliwell, R. Ubank, and H. Harrison 1980 27 p refs
(PNR-90072) Avail: NTIS HC A03/MF A01

The state of the art in powder material and processes for aircraft engine combustor, blade, and disk alloys was reviewed. Processes developed in the 1970's include: gas atomization of superalloy powder for critical rotating parts; rotating electrode atomization for titanium powder in similar components; controlled thermomechanical processing of attrited powders in order to produce superalloy sheet and airfoil parts; and plasma sprayed gas atomized powder for hot section overlay and thermal barrier coatings. Development in titanium powder metallurgy is hampered by difficulties in obtaining clean powder. Properties equivalent to a conventionally processed product are obtained in current alloys, with possible cost advantages. Author (ESA)

N82-22360# National Aerospace Lab., Amsterdam (Netherlands). Div. of Structures and Materials.
ENGINEERING PROPERTY COMPARISONS OF 7050-T73651, 7010-T7651 AND 7010-T73651 ALUMINUM ALLOY PLATE
L. Schra and W. G. J. tHart Dec. 1980 33 p refs Submitted for publication
(NLR-MP-80047-U) Avail: NTIS HC A03/MF A01

The strength, stress corrosion resistance, fracture toughness and fatigue crack propagation resistance under flight simulation loading of aluminum alloys was tested. Standard tensile, notch, center cracked and flight simulation tests were performed. In order to study stress corrosion crack initiation, tuning fork type specimens were clamped to a wheel which immersed them in a 3.5% aqueous NaCl solution for 10 min/hr. Testing lasted for two months. Results show that both 7050 and 7010 are high strength deep hardening alloys with only minor differences in crack tolerance properties. The fracture toughness of both alloys is equivalent, while 7050 possesses slightly better resistance to stress corrosion cracking and fatigue crack propagation under flight simulation loading. Author (ESA)

N82-22362# Transportation Research Board, Washington, D.C.
PAVEMENT MANAGEMENT AND REHABILITATION OF PORTLAND CEMENT CONCRETE PAVEMENTS
Charles V. Zegeer, Kenneth R. Agent, Rolands L. Rizenbergs, F. C. Curtayne, T. Scullion, R. Daryl Pedigo, W. Ronald Hudson, Freddy L. Roberts, M. A. Karan, Ralph Haas et al 1981 79 p refs
(PB82-131384; TRB/TRR-814; ISBN-0-309-03258-5; ISSN-0361-1981; LC-81-18982) Avail: NTIS HC A05/MF A01; HC also available from Transportation Research Board, 2102 Constitution Ave., NW, Washington, D.C. 20418 CSCL 13B

Pavement management and rehabilitation projects and techniques are discussed. The following topics are discussed: economic analyses and dynamic programming in resurfacing project selection; implementation of an urban pavement management system; pavement performance modeling for pavement management; illustration of pavement management: from data inventory to priority analysis; rehabilitation of concrete pavements by using portland cement concrete overlays; pavement management study: Illinois tollway pavement overlays; resurfacing of plain jointed-concrete pavements; design procedure for premium composite pavement; model study of anchored pavement; prestressed concrete overlay at O'Hare International Airport, in-service evaluation; and, bonded portland cement concrete resurfacing. GRA

[illegible]*# Ohio State Univ., Columbus. Dept. of Electrical Engineering.

methods, tests, and results, concerning system interpretation, system dynamics and achievable cost reduction, are described. The problems with an integrated digital flight control system are treated. Gust load alleviation can be realized with available components. Operating cost reductions from 1% to 1.5% can be obtained. The choice of control surfaces represents a risk, since their unsteady highly subsonic aerodynamics during fast control is not sufficiently known. Author (ESA)

N82-23253# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Kurzuebericht fuer Information und Dokumentation.

ACTTA: INVESTIGATION OF NEW PILOTING AND FLIGHT CONTROL TECHNOLOGIES. VOLUME 2: AIRCRAFT WITH REDUCED LATERAL STABILITY Milestone Report on Phase 1, 1979 - 1980 [ACTTA: UNTERSUCHUNG NEUARTIGER STEUERUNGS- UND FLUGFUEHRUNGSTECHNOLOGIEN. MEILENSTEINBERICHT ZUR PHASE 1: 1979/1980. BAND 2: FLUGZEUG REDUZIERTER LAENGSSTABILITAET]

Weise Kolander and U. A. Fischer 23 Mar. 1981 194 p refs In GERMAN 2 Vol.
(Contract BMFT-LFK-7960-9)
(MBB-UH-05-81-Vol-2) Avail: NTIS HC A09/MF A01

The stretched version of the A-300 aircraft was used to assess the feasibility and economy of various digital flight technologies for aircraft with reduced lateral stability. Investigation methodology, calculation methods, tests, and results, concerning system interpretation, system dynamics and achievable cost reduction, are described. Operating cost reduction of 1% to 3% is expected with reduced stability, using a trim tank as the first step in a stepped design where sufficient emergency flight safety is maintained in case the stabilizing system fails. Author (ESA)

N82-23254* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

METRIC HALF-SPAN MODEL SUPPORT SYSTEM Patent

Charlie M. Jackson, Jr., Samuel M. Dollyhigh, and David S. Shaw, inventors (to NASA) Issued 4 May 1982 5 p Filed Supersedes N80-24334 (18 - 15, p 1943)
(NASA-Case-LAR-12441-1; US-Patent-4,327,581; US-Patent-Appl-SN-145210; US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 14B

A model support system used to support a model in a wind tunnel test section is described. The model comprises a metric, or measured, half-span supported by a nonmetric, or nonmeasured half-span which is connected to a sting support. Moments and forces acting on the metric half-span are measured without interference from the support system during a wind tunnel test. Official Gazette of the U.S. Patent and Trademark Office

N82-23255# British Aerospace Aircraft Group, Preston (England). Engine Simulation Section.

DEVELOPMENT OF A CONVOLUTED INTAKE SEAL FOR MODEL R66

A. P. Winstanley Mar. 1981 33 p refs
(BAE-ARG-163) Copyright. Avail: NTIS HC A03/MF A01

A low constraint convoluted seal is described which connects the live intake to the earthed ejector duct in a 1/7.5 scale low speed model with full engine simulation. A 6 component model with two earthed ejectors is required. Several seals were tested, achieving a progressively lower constraint by modifying either the geometry, material or manufacturing process. Subjecting the final seal to a representative pressure difference and end offset causes a lateral load of 6N, but incorporating the modifications recommended for future seals reduces this. Because the seals are on a moment arm from the balance when they are installed in the model, calibrations may have to account for pressure and end misalignment. A facility for measuring pressure differences at the seal is incorporated in the design. Author (ESA)

N82-23263# National Aerospace Lab., Amsterdam (Netherlands). Spaceflight Div.

MULTILAYER INSULATION BLANKETS FOR SPACECRAFT APPLICATIONS. THERMAL MODEL ACCOUNTING FOR OUTGASSING AND DIFFERENT WAYS OF GAS MIGRATION

A. A. M. Delil and J. F. Heemskerk 2 Sep. 1981 10 p refs Presented at 7th Intern. Heat Transfer Conf., Munich, 6-10 Sep. 1982
(NLR-MP-81051-U) Avail: NTIS HC A02/MF A01

A model of hybrid pumping (broadside and edge) in spacecraft insulation blankets was developed for an evacuated circular multilayer insulation blanket placed between a hot and a cold boundary. The blanket consists of parallel identical perforated shields with left and right side emissivity. Shield thickness is so small that shield temperature is assumed to be even. The gas is assumed to flow from the hot towards the cold boundary, as in the case of insulation of a hot black box from cold space environment. The model also applies for cryogenic vessel insulation (the cryogen at the cold side, the low pressure environment at the hot boundary) by interchanging suffixes in the governing equations. Results from guarded hot plate calorimeter tests confirm model predictions. Author (ESA)

N82-23281# Utah Univ., Salt Lake City.

THE EFFECT OF AN ACIDIC CATALYST ON SIMULTANEOUS HYDRODENITROGENATION AND HYDRODESULFURIZATION OF MODEL COMPOUNDS Ph.D. Thesis

Holly Jean Moore 1981 171 p
Avail: Univ. Microfilms Order No. 8125903

The hydrodesulfurization of thiophene and the hydrodenitrogenation of pyridine over acidic catalysts was studied. Four catalysts were considered: CoMo-SiO2/Al2O3, CoMo-Al2O3, NiW-SiO2/Al2O3, and NiW-Al2O3. These catalysts were chosen so that the effect of the metallic complex and the effect of the acidic support could be isolated. Reaction conditions of 200 to 400 C and 40 to 200 psia were used. A two site reaction mechanism (sites 1 and 2) based on the Langmuir adsorption isotherm was used to model the reaction of thiophene. A single site (site 1) analysis described the reaction of pyridine. Values of the reaction rate constants (k), and the adsorption equilibrium constants (K) were calculated from the data collected for pure thiophene, pure pyridine, and for a 50/50 solution of each. The results showed that both thiophene and pyridine adsorb significantly on the type 1 sites, but not on the type 2 sites. No consistent metal effect (NiW or CoMo) was observed. However, alumina was the more effective catalyst substrate for the reaction of both thiophene and pyridine for 50/50 feeds. Alumina was also more effective for pure thiophene reaction, but silica alumina was more effective for pyridine reaction from a pure feed. Dissert. Abstr.

N82-23409# Research Inst. of National Defence, Linkoeping (Sweden).

TRANSIENT MEASUREMENTS UNDER ELECTRIC PULSE EXCITATION IN 37 VIGGEN AIRCRAFT [TRANSIENTMAETNINGAR VID STROEMPULSEXCITERING AV FPL-37 VIGGEN]

Sven Garmland Oct. 1981 54 p In SWEDISH
(FOA-C-30243-A3) Avail: NTIS HC A04/MF A01

Determinations of the magnetic field at different locations in aircraft and of the induced electromotive force in two typical communication cables of a transmission system, during full scale electric pulse tests, are reported. These measurements were carried out in relation with lightning tests, for trying out a computerized measurement system, including transient digitizers, microwave link and magnetic field cells. The pulse generator was equipped with capacitors charged up to 75 kV, developing a sine wave 30 kHz pulse current with a 100 kA max amplitude. Results enabled a computer program to be modified so as to account for actual conditions. Author (ESA)

N82-23471*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

BLOCKAGE AND FLOW STUDIES OF A GENERALIZED TEST APPARATUS INCLUDING VARIOUS WING CONFIGURATIONS IN THE LANGLEY 7-INCH MACH 7 PILOT TUNNEL

Cindy W. Albertson Mar. 1982 50 p
(NASA-TM-83301; NAS 1.15:83301) Avail: NTIS HC A03/MF A01 CSCL 20D

A 1/12th scale model of the Curved Surface Test Apparatus (CSTA), which will be used to study aerothermal loads and evaluate Thermal Protection Systems (TPS) on a fuselage-type configuration in the Langley 8-Foot High Temperature Structures Tunnel (8 ft HTST), was tested in the Langley 7-Inch Mach 7 Pilot Tunnel. The purpose of the tests was to study the overall flow characteristics and define an envelope for testing the CSTA in the 8 ft HTST. Wings were tested on the scaled CSTA model to select a wing configuration with the most favorable characteristics for conducting TPS evaluations for curved and intersecting surfaces. The results indicate that the CSTA and selected wing configuration can be tested at angles of attack up to 15.5 and 10.5 degrees, respectively. The base pressure for both models was at the expected low level for most test conditions. Results generally indicate that the CSTA and wing configuration will provide a useful test bed for aerothermal pads and thermal structural concept evaluation over a broad range of flow conditions in the 8 ft HTST. Author

N82-23494*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HISTORICAL PERSPECTIVES ON THERMOSTRUCTURAL RESEARCH AT THE NACA LANGLEY AERONAUTICAL LABORATORY FROM 1948 TO 1958

Richard R. Heldenfels *In its* Computational Aspects of Heat Transfer in Struct. 1982 p 383-392 refs

Avail: NTIS HC A24/MF A01 CSCL 20D

Some of the early research on structural problems produced by aerodynamic heating, conducted at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics from 1948 to 1958 is described. That was the last decade of the NACA; in 1958 NACA became the nucleus of NASA. The NACA initially contracted for research but was aware that a well-equipped and suitably staffed laboratory was required to fulfill its obligations. Langley was established in 1920; the other listed were added during the NACA expansion in the World War II years. Some specific research activities are described, starting with calculation of the temperature of the structure. B.W.

N82-23542# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.

COMPARISON OF RELIABILITY, SENSITIVITY AND ACCURACY OF SOME NDI-TECHNIQUES

E. A. B. deGraaf and P. deRijk Oct. 1980 32 p refs In DUTCH; ENGLISH summary Presented at Dutch Soc. for Non-Destructive Testing Lecture Series, 4 Nov. 1980

(NLR-MP-80039-U) Avail: NTIS HC A03/MF A01

Reliability, sensitivity and accuracy of some nondestructive inspection (NDI) methods were investigated and compared. Reliability, sensitivity and accuracy of nondestructive inspection are defined. The restrictions on reusing NDI reliability specimens are described. Inspection results obtained with fluorescent and red penetrants are compared. Reliability, sensitivity and accuracy of a number of the most popular NDI methods, as applied to aluminum specimens and rejected steel aircraft landing gear components are treated. Three investigations are briefly depicted. Spreading in NDI results is substantial. Corrosion deteriorates reliability, sensitivity and accuracy. Red penetrant is much worse than fluorescent penetrant. Fluorescent penetrant inspection results strongly depend on the specimen configuration and vary from very good to moderate. Eddy current method gives good results. Magnetic inspection is advisable wherever it can be applied. Author (ESA)

N82-23549*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

A TWO-DEGREE-OF-FREEDOM FLUTTER MOUNT SYSTEM WITH LOW DAMPING FOR TESTING RIGID WINGS AT DIFFERENT ANGLES OF ATTACK

Moses G. Farmer Apr. 1982 20 p refs Presented at Va. Academy of Sci. Meeting, Blacksburg, Va., 20-23 Apr. 1982

(NASA-TM-83302; NAS 1.15:83302) Avail: NTIS HC A02/MF A01 CSCL 14B

A wind tunnel model mount system for conducting flutter research using a rigid wing was developed. The wing is attached to a splitter plate so that the two move as one rigid body. The splitter plate is supported away from the tunnel wall by a system of rods with fixed fixed and conditions. The rods flex in such a way that only pitch and plunge oscillations are permitted. At the tunnel wall the rods are attached to a remotely controlled turntable so that angle of attack can be varied. Wind tunnel data obtained by using the mount system are presented for a supercritical and a conventional airfoil. Both classical flutter and stall flutter data are presented. S.L.

N82-23560# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugmechanik.

A THEORETICAL STUDY OF THE IMPACT OF AIRCRAFT WAKE VORTICES ON ROOFS IN THE FINAL APPROACH AREA OF DUSSELDORF AIRPORT

Otto Weber and Rolf Ulken Dec. 1981 63 p refs In GERMAN; ENGLISH summary

(DFVLR-Mitt-82-01) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 21,50

Damage to buildings caused by the impact of trailing wake vortices shed from widebodied aircraft in the final approach area of Dusseldorf Airport was studied. Forty-two occurrences of roof damage were analyzed, using a simplified model for the strength, transport, and decay of wake vortices. The model is interpreted with reference to the results of a vortex alleviation program carried out in the U.S. Wake vortex characteristics, maximum tangentinl velocity and vortex decay are discussed. Measurement of vortex far field reduction is considered. Other investigations of roof damage in the approach areas of Hamburg, Berlin (Tempelhof), and London (Heathrow) airports are summarized. The value of potential aircraft modifications and precautions on the ground are assessed, suggesting supplementary measurements on board aircraft and in buildings. Author (ESA)

N82-23561# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.

SOME CASE STUDIES AND THE SIGNIFICANCE OF FATIGUE THRESHOLDS

R. J. H. Wanhill Apr. 1981 15 p refs Presented at Intern. Symp. on Fatigue Thresholds, Stockholm, Jun. 1981

(NLR-MP-81015-U) Avail: NTIS HC A02/MF A01

Examples of service failures, involving low-cycle and/or high-cycle fatigue, are described and discussed with respect to the significance of thresholds for high-cycle fatigue crack propagation. The examples are: aircraft undercarriage cylinders made of high strength 4340 steel; aircraft gas turbine compressor drive shafts made of A286 steel; and aircraft gas turbine blades made of Rene 80 nickel-base superalloy. The examples show that the importance of Delta K sub th is unlikely to be important for a particular service fatigue problem. Delta K sub th as a design criterion is restricted to safe crack growth components and structures whose anticipated service loads consist mainly or entirely of large numbers of low amplitude cycles and which are difficult or impossible to inspect in service. Author (ESA)

N82-24050*# Boeing Vertol Co., Philadelphia, Pa.

AN INVESTIGATION OF ROTOR HARMONIC NOISE BY THE USE OF SMALL SCALE WIND TUNNEL MODELS Final Report

Harry Sternfeld, Jr. and Edward G. Schaffer Apr. 1982 100 p refs

(Contract NAS2-10767)

(NASA-CR-166337; NAS 1.26:166337) Avail: NTIS HC A05/MF A01 CSCL 20A

Noise measurements of small scale helicopter rotor models were compared with noise measurements of full scale helicopters to determine what information about the full scale helicopters could be derived from noise measurements of small scale helicopter models. Comparisons were made of the discrete frequency (rotational) noise for 4 pairs of tests. Areas covered were tip speed effects, isolated rotor, tandem rotor, and main rotor/tail rotor interaction. Results show good comparison of noise trends with configuration and test condition changes, and good comparison of absolute noise measurements with the corrections used except for the isolated rotor case. Noise measurements of the isolated rotor show a great deal of scatter reflecting the fact that the rotor in hover is basically unstable. Author

N82-24137*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

RESEARCH AND TECHNOLOGY ANNUAL REPORT FY-1981

Nov. 1981 100 p

(NASA-TM-84199; NAS 1.15:84199) Avail: NTIS HC A05/MF A01 CSCL 05A

Space transportation systems are summarized: space shuttle enhancement, a space operations center, the space platform, and geostationary activities are discussed. Aeronautics and space technology are summarized: experiments, energy systems, propulsion technology, synthetic aperture radar, large space systems, and shuttle-launched vehicles are discussed. Space sciences are summarized: lunar, planetary, and life sciences are discussed. Space and terrestrial applications are summarized. The AgRISTARS program, forest and wildland resource, and Texas LANDSAT applications are discussed. N.W.

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Soaring Society of America, National Convention, Phoenix, AZ, January 14-18, 1981, Proceedings A82-29414

Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports A82-29576

Structures, Structural Dynamics and Materials Conference, 23rd, New Orleans, LA, May 10-12, 1982, Collection of Technical Papers. Part 1 - Structures and materials. Part 2 - Structural dynamics and design engineering A82-30076

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AERONAUTICAL ENGINEERING

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(Supplement 151)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in July 1982 in

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- *International Aerospace Abstracts (IAA).*

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study should be undertaken by the ICAO Secretariat. A report is provided on developments both at national and international levels connected with the considered subject. Major trends in recent ICAO thinking on the technical side of aircraft and incident investigation procedures are examined, and developments in the U.S. are considered. Resolutions adopted by the European Parliament in relation to air traffic safety issues are also discussed, and attention is given to developments in the Netherlands, Switzerland, Sweden, New Zealand, and Canada. G.R.

A82-29414 **Soaring Society of America, National Convention, Phoenix, AZ, January 14-18, 1981, Proceedings.** Edited by J. Lincoln. Phoenix, AZ, Arizona Soaring Association, 1981. 120 p.

Features of modern sailplaning, contests, and hang gliding are reviewed. Equipment maintenance and use in sailplanes are discussed, including the calibration of variometers, charging batteries, and types of batteries. Sport hang gliding is described, as is competition tactics and photography. Homebuilt sailplanes are examined from the point of view of a home sailplane builder and a manufacturer of kits, and NASA research relevant to sailplane airfoils is explored. Finally, new concepts in Dolphin Tactics for continuously changing airspeed to maximize performance during a variety of sailplane maneuvers are detailed. M.S.K.

A82-29415 **Checking and calibrating variometers in place in the sailplane instrument panel.** R. H. Ball. In: Soaring Society of America, National Convention, Phoenix, AZ, January 14-18, 1981, Proceedings. Phoenix, AZ, Arizona Soaring Association, 1981, p. 29-38.

Techniques for calibrating the variometer, pitot total energy compensation, and netto and cruise controls while they are in a glider instrument panel are described. The panel is assumed to feature an altimeter and clock, and further tools recommended are a bottle, a needle valve, a hypodermic syringe, tubing, and fittings. Exact calibration of the variometer in conjunction with the altimeter by setting the pressure equal to 3000 ft using a bottle is described, along with descent rate measurements to assure proper altitude change tracking. Further discussion is given of calibrating a total energy variometer, checking airspeed with an altimeter, the netto compensation principle and calibration, and calibrating the cruise control. Finally, attention is given to altitude errors with a variometer and to best flying speed at various altitudes. M.S.K.

A82-29416 **Development of a homebuilt powered sailplane.** A. Strojnik. In: Soaring Society of America, National Convention, Phoenix, AZ, January 14-18, 1981, Proceedings. Phoenix, AZ, Arizona Soaring Association, 1981, p. 77-89.

Design and problem solving in the fabrication of the S-2, a 15 m powered sailplane test flown in 1980, are discussed. Weight penalties, the use of a retractable engine to maintain aerodynamic cleanliness, increases in drag due to the presence of an enlarged fuselage area and a propeller, and the normal solution of placing the engine at the rear of a pod-and-boom fuselage are detailed. The S-2 features outrigger wheels on the wingtips, one under the pod, and the steering wheel under the tail. The wings are constant chord with trapezoidal outer 4 ft sections to furnish an elliptical lift distribution at high lift coefficients. A middle wing section is reinforced by a carbon fiber spar, covered in 3-layer fiberglass skins, and shaped into a Wortman airfoil. Young's moduli for the materials are provided. The quality of the wing skin and the precision machining of the propeller are regarded as the two most crucial aspects of the S-2. M.S.K.

A82-29417 * **NASA research related to sailplane airfoils.** D. M. Somers (NASA, Langley Research Center, Hampton, VA). In: Soaring Society of America, National Convention, Phoenix, AZ, January 14-18, 1981, Proceedings. Phoenix, AZ, Arizona Soaring Association, 1981, p. 99-109. 8 refs.

The theoretical methods and experimental facilities at the NASA Langley Research Center have been employed to conduct investigations of sailplane airfoils. The unique and powerful capabilities of the Eppler Program have been used to design and analyze many airfoils and to smooth several Wortmann airfoils. Wind-tunnel investigations of two sailplane airfoils have been conducted in the Langley low-turbulence pressure tunnel. A procedure for sailplane performance improvement has been outlined. (Author)

A82-29576 **Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports (Brand- und Katastrophenbekämpfung aus der Luft; Internationales Wissenschaft-Technisches Symposium, Hanover, West Germany, June 11, 12, 1980, Vorträge).** Symposium sponsored by the Bundesministerium für Forschung und Technologie. Melsungen, West Germany, A. Bernecker Verlag, 1981. 242 p. In German. $16.25.

Attention is given to fighting forest fires with the aid of aircraft in the U.S., the fighting of forest fires as a task for the Swiss air force, the current state of technology concerning the fighting of forest fires from the air in Austria, the utilization of agricultural aircraft in economical operations for fighting fires in Israel, and the utilization of aircraft in fighting forest fires in France. The use of 'water bombers' and chemical agents against forest fires is considered along with the employment of two-engine and four-engine aircraft for dropping the latest chemical fire extinguishing agents in connection with the fighting of forest fires, the adaptation and equipment of aircraft for the fighting of forest fires, and the employment of helicopters in Austria in connection with large-scale fires in buildings. Other topics discussed are related to the performance characteristics and employment profiles of the new helicopter BK117, and a comparative evaluation of fire extinguishing agents involving the use of foam. G.R.

A82-29577 # **Fighting forest fires with the aid of aircraft in the United States of America (Waldbrandbekämpfung mit Luftfahrzeugen in den Vereinigten Staaten von Amerika).** E. W. Keegan (U.S. Forest Service, Washington, DC). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 17-27. In German.

A82-29578 # **Fighting forest fires - A task for the Swiss air force (Waldbrandbekämpfung - Eine Aufgabe der Schweizerischen Flugwaffe).** R. Salzborn (Schweizer Luftwaffe, Locarno, Switzerland). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 28-33. In German.

Forest fires in the Swiss Alps are considered. It is found that the great majority of all fires is produced by people. The development of a fire as a consequence of lightning is a very rare event. Long-term consequences of forest fires are related to a reduction in the natural capacity of forests to provide protection against avalanches and falling stones. Efforts to fight fires with the aid of aircraft go back to 1962. Fixed-wing aircraft were first utilized in firefighting operations. However, in recent years the use of such aircraft has decreased significantly in connection with the advantages provided by the helicopter for the considered applications. Attention is given to the methods used in firefighting operations conducted with fixed-wing aircraft and with helicopters, taking into account direct approaches and indirect support action. G.R.

A82-29579 # **The current state of technology concerning the fighting of forest fires from the air in Austria (Stand der Technik zur Waldbrandbekämpfung aus der Luft in Österreich).** T. Angermair (Berufsfeuerwehr, Innsbruck, Austria). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 34-39. In German.

In 1973, difficulties related to the fighting of forest fires by conventional means led in Austria to an investigation of more effective firefighting methods. It was first attempted to provide aircraft to ensure rapid transportation for the men and the equipment needed for the firefighting operations. The helicopter was found to provide significant advantages as a rapid means of transportation, taking into account its capability to convey men and material to and from locations not readily accessible by any other means. The successful solution of all problems related to the envisaged use of the aircraft in firefighting operations was practiced in approximately 300 exercises. Attention is given to the number of aircraft used in Austria for firefighting operations, the employed fire extinguishing agents, the attachment of the containers to the aircraft, financial questions, and details concerning the firefighting operations. G.R.

A82-29580 # **The utilization of agricultural aircraft in economical operations for fighting forest fires in Israel (Die Nutzung landwirtschaftlicher Flugzeuge zur ökonomischen Waldbrandbekämpfung in Israel).** I. Hirsch (Chimavir Services, Tel Aviv, Israel). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 40-43. In German.

The approaches used to protect the coniferous forests of Israel against destruction by forest fires are discussed. The need for such a protection is illustrated by the fact that, in 1979, 2,500,000 trees were destroyed in connection with a total of 600 fires. It had been found that forest fires cannot be effectively controlled on the basis of an exclusive use of ground operations. However, financial considerations made it impossible to obtain for the protection of the forests special aircraft expressly designed for firefighting applications. It was, therefore, decided to utilize aircraft normally used for agricultural applications also for operations related to the fighting of forest fires. Particular attention is given to special approaches which make it possible to apply water for extinguishing fires most effectively from the available aircraft. G.R.

A82-29581 # **The utilization of aircraft in fighting forest fires - French experience (Nutzung der Luftfahrtmittel bei der Waldbrandbekämpfung - Französische Erfahrungen).** H. Bolzinger (Ministère de l'Intérieur, Securité Civile, Marignane, Bouches-du-Rhône, France). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 44-52. In German.

Environmental and weather-related conditions in the case of a substantial part of the French forests, taking into account, in particular, coniferous woods, make it necessary to employ aircraft in connection with the protection of these forests against destruction by fire. In 1963, aircraft were used, for the first time in France, in operations related to the fighting of fires in forests. A review is provided of the aircraft available in 1980 for the protection of French forests against destruction by fire, giving attention to light aircraft used in surveillance operations, helicopters, and air tankers. The helicopter can provide a flying command post for the direction of firefighting operations. Other functions of the helicopter are related to its use as a convenient means of transportation in areas with accessibility problems. The air tanker carries water and other agents for an employment in direct firefighting operations from the air. G.R.

A82-29582 # **The use of 'water bombers' and chemical agents against forest fires, taking into account the employment of a first-attack system (Einsatz von Wasserbombern und chemischen Mitteln gegen Waldbrände unter Verwendung eines Erstangriffssystems).** K. B. Marsden (Conair Aviation, Ltd., Abbotsford, British Columbia, Canada). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 66-79. In German.

Fires in the forests, arid lands, and agricultural areas of Western Canada are efficiently controlled by making use of aircraft which drop chemical firefighting agents that remain effective for a long time. The considered approach of fighting fires must be integrated into a coordinated program, involving an early detection of the fire, the availability of aircraft for immediate employment, and the ultimate complete extinction of the fire in connection with ground-based operations. Attention is given to the geographical features of the area of Western Canada, its meteorological characteristics and its vegetation, the design of the employed aircraft, and details regarding the implementation of the considered program. The operations performed by the aircraft are illustrated with the aid of pictures. G.R.

A82-29583 # **The employment of two-engine and four-engine aircraft for dropping the latest chemical fire extinguishing agents in connection with the fighting of forest fires (Einsatz von zwei- und viermotorigen Flugzeugen für den Abwurf der neuesten chemischen Löschmittel bei der Waldbrandbekämpfung).** R. A. Davis (Sis-Q Flying Service, Inc., Santa Rosa, CA). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 88-96. In German.

A82-29584 # **Adaptation and equipment of aircraft for the fighting of forest fires (Anpassung und Ausrüstung von Flugzeugen zur Waldbrandbekämpfung).** R. E. Foy (Aero Union Corp., Chico, CA). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 97-103. In German.

In connection with the selection of an aircraft for aerial firefighting operations, two alternatives have to be considered. An aircraft expressly designed for firefighting applications can be purchased, or an available aircraft designed for civil or military service applications can be acquired with the aim to adapt the aircraft to the requirements which have to be met in connection with the intended future use. Taking into account the high cost of a new aircraft design, it might be preferable, on the basis of economic considerations, to decide in favor of the second alternative. All private firms concerned with the operation of aircraft for the aerial application of fire retardants and fire extinguishing agents in North America use currently surplus civil aircraft or former military aircraft. Attention is given to economic considerations regarding the operations of such aircraft, questions of aircraft suitability for the envisaged applications, and operational details. G.R.

A82-29585 # **The employment of helicopters in Austria in connection with large-scale fires in buildings (Hubschraubereinsätze bei Gebäudegrossbränden in Österreich).** T. Angermair (Berufsfeuerwehr, Innsbruck, Austria). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 138-146. In German.

Special problems concerning rescue operations in the case of large fires in buildings and the fighting of these fires exist in Austria in a very significant number of cases. About one tenth of all Austrians live in high buildings at levels above the 'critical height' of 22 m from the ground. In connection with fires, situations arise in which people are isolated because all possible avenues of retreat have been cut off. The chances for the rescue of people in burning buildings can be significantly improved by supplementing the conventional approaches of the fire department with techniques involving the use of helicopters. It has been found that in the case of pilots experienced in rescue operations in mountainous areas very little additional training is required for the conduction of operations involving the rescue of people in buildings. The conduction of such operations is discussed in detail. G.R.

A82-29586 # **Performance characteristics and employment profiles of the new helicopter BK117 (Leistungsmerkmale und Einsatzprofile des neuen Hubschraubers BK117).** Mr. Schmidt-Bischoffshausen (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). In: Fighting fire and other disasters from the air; International Scientific-Technical Symposium, Hanover, West Germany, June 11, 12, 1980, Reports. Melsungen, West Germany, A. Bernecker Verlag, 1981, p. 148-166. In German.

Attention is given to a new helicopter developed jointly by a German aerospace company and a Japanese company. The helicopter can take off and land vertically, has the ability to hover, and can also move slowly in any lateral direction. These flight characteristics have provided for the helicopter a special area of application related to the prevention of fires, the fighting of fires, and protective operations in the case of the occurrence of disasters. Requirements for successful operations involving the fighting of fires are considered, taking into account the importance of an early detection of a fire, the need for an immediate initiation of operations, the achievement of an

N82-22159# General Dynamics/Fort Worth, Tex.
DYNAMIC QUALIFICATION TESTING OF F-16 EQUIPMENT
H. E. Nevius and W. J. Brignac *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 15 p

Avail: NTIS HC A11/MF A01

Vibration prediction methods and qualification test procedures are presented for F-16 equipment. Measured vibration levels are also compared to the predictions. The most severe vibratory environment is produced by the muzzle blast pressure during gunfiring. Gunfiring vibration was measured during the YF-16 prototype program which indicated a correlation between vibration levels and distance from the gun port. Vibration data are presented verifying this relationship. Nongunfiring random vibration test levels are shown for F-16 airframe zones. The prediction procedures were based on a relationship between vibration and dynamic pressure using measured data from other aircraft. Vibration levels were measured on fuselage mounted stores. Other measured dynamic environments are presented which include wing tip missile response to store ejection from wing pylons and to jet wake encounter, and buffet response at high-angles-of-attack. Author

N82-22160# McDonnell-Douglas Corp., St. Louis, Mo. Structural Dynamics Sect.
DEVELOPMENT OF VIBRATION QUALIFICATION TEST SPECTRA FOR THE F-15 AIRCRAFT
G. R. Waymon *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 19 p refs

Avail: NTIS HC A11/MF A01

The vibration test spectra used for an F-15 Eagle were based on analytical predictions combined with measured data from similar aircraft. The low frequency vibration below approximately 50 Hertz results primarily from aircraft response to gusts, buffet, landing, and taxi excitation. Vibration at higher frequencies is primarily associated with acoustical excitation and gunfire. The airplane was divided into regions of comparable vibration levels. The test levels were derived using the predicted spectra and applying factors to define a performance and an endurance test. The F-15 flight measured data were used to update these predictions for the present test spectra. Author

N82-22161# British Aerospace Aircraft Group, Kingston-upon-Thames (England).
EQUIPMENT VIBRATION QUALIFICATION FOR HARRIER AND HAWK AIRCRAFT
D. C. Thorby *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 7 p refs

Avail: NTIS HC A11/MF A01

Equipment for later versions of the Harrier and all versions of the Hawk aircraft were cleared for flight vibration using test procedures based on the current British Standard. The rationale used in applying this Specification, and the flight vibration test procedures are briefly outlined from a practical viewpoint. Author

N82-22162# Industrieanlagen-Betriebsgesellschaft m.b.H., Ottobrunn (West Germany).
ACOUSTIC NOISE TEST AS PART OF THE DYNAMIC QUALIFICATION PROGRAM IN AEROSPACE
G. Bayerdoerfer *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 7 p
Avail: NTIS HC A11/MF A01

The mechanisms of noise generation for the purpose of acoustic qualification tests are described. Special emphasis is given to the modal density of acoustic noise fields in enclosures, such as reverberation chambers. A test program shows that for small components a sufficient modal density can be achieved in relatively small test chambers. Where applicable small chambers are favorable because of the lower test costs. Author

N82-22164# Vereinigte Flugtechnische Werke-Fokker G.m.b.H., Bremen (West Germany). Abt. Dynamik/Aeroelastik.
AIRCRAFT FUEL TANK SLOSH AND VIBRATION TEST

Helmut Zimmermann *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 11 p

Avail: NTIS HC A11/MF A01

A dynamic qualification test for a subsonic and a supersonic external drop tank for a European fighter is presented. The test rig and the specimens are described and the measuring results are discussed. It is shown that for the supersonic tank as well as for the subsonic tank a certain slosh angle an eigenfrequency of the rig increases the amplitudes at the excitation position and the accelerations on the tank. For the subsonic tank it seems that an eigenfrequency is excited for the nose down position of the tank. The qualification requirements are examined. It is proposed that instead of using an arbitrary vibration amplitude and frequency for excitation, frequency ranges and amplitudes which are averaged out of flight measurements at the tank attachment points on the aircraft be used and that the demand for a certain input amplitude at the top of the attachment bulkheads and an output amplitude at the bottom of the attachment bulkheads be deleted. E.A.K.

N82-22165# Army Aviation Research and Development Command, St. Louis, Mo. Structures and Aeromechanics Div.
THE STRUCTURAL DYNAMIC INTERFACE REQUIRED FOR DEVELOPING HELICOPTER TARGET ACQUISITION SYSTEMS
Sam T. Crews *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 9 p refs

Avail: NTIS HC A11/MF A01

A brief description of the helicopter vibration environment is given. Two development programs were used as examples to show how vibration sensitive target acquisition systems can be interfaced to a helicopter. The systems are the Target Acquisition Data System/Pilot Night Vision System mounted to the nose of the Army's new Advanced Attack Helicopter and the Stand-Off Target Acquisition System mounted underneath the Army's BLACK HAWK helicopter. The qualification strategy and specific testing performed and to be performed are included. Author

N82-22166# Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).
APPROACH IN DYNAMIC QUALIFICATION OF LIGHT HELICOPTER STORES AND EQUIPMENTS
D. Braun and J. Stoppel *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 8 p refs

Avail: NTIS HC A11/MF A01

Problems occurring in connection with the dynamic qualification of equipment and external stores for light military helicopters are evaluated. Special features of the helicopter vibratory environment are discussed. Some general recommendations for the procedure of dynamic qualification for use with helicopters are given. The approach for dynamic qualification of relatively heavy equipment is presented using the example of combining the MBB BO 105 helicopter with HOT anti-tank missile launchers. To obtain a basic understanding of the dynamic behavior of the helicopter with external stores preliminary dynamic calculations were made. Shake tests were done with the separated external stores and flight test vibration measurements were obtained. Test results are presented with regard to the harmonic main rotor excitation. M.D.K.

N82-22167# Westland Helicopters Ltd., Yeovil (England). Dynamics Dept.
THE DYNAMIC QUALIFICATION OF EQUIPMENT AND EXTERNAL STORES FOR USE WITH ROTARY WINGED AIRCRAFT
G. M. Venn *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 11 p
Avail: NTIS HC A11/MF A01

The dynamic regime imposed on helicopter-borne stores and equipment, highlighting the differences between the rotary and fixed-wing environments are outlined. The need for helicopter requirements to be addressed in particular, is discussed. The influence of a number of contributory factors to the dynamic environment arising from varying military applications covering both land and sea operation is also discussed. The dynamic criteria for design and testing are given, explaining the particular influence of discrete sinusoidal forcing on the helicopter environment. The evolution of these standards and their consolidation through flight and service experience is explained. Some views on the future development of dynamic qualification criteria for rotary-winged aircraft are also outlined. M.D.K.

N82-22168# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. of Aeroelasticity.

APPLICATION OF MODAL SYNTHESIS TECHNIQUES FOR THE DYNAMIC QUALIFICATION OF WINGS WITH STORES

E. Breitbach *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 22 p refs

Avail: NTIS HC A11/MF A01

Dynamic qualification as well as flutter clearance of modern combat aircraft were studied using model coupling methods. Emphasis was placed on how to deal with special phenomena due to nonlinearities, in particular combinations of backlash and dry friction, in the connecting parts between wing, pylon and store which may significantly infringe on the validity of the linear mathematical models as used in ground and flight vibration testing. M.D.K.

N82-22169# Boeing Military Airplane Development, Seattle, Wash. Structural Dynamics Dept.

STOL AIRCRAFT STRUCTURAL VIBRATION PREDICTION FROM ACOUSTIC EXCITATION

B. F. Dotson and J. Pearson (AFWAL) *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 20 p refs

Avail: NTIS HC A11/MF A01

A method was developed to improve environment vibration prediction methods, particularly in the lower frequency range where high acoustic excitation is expected on STOL aircraft. A rigorous mathematical spectral analysis approach was used which simulated the structure with finite element models (FEM) and used measured and calculated acoustic input data for the forcing function. Calculated and measured vibrations levels were compared on a medium sized Upper Surface Blowing (USB) STOL aircraft. The development of a method for prediction of the external acoustic environment of USB flap-type STOL aircraft was also accomplished. The method compares favorably with actual measurements and represents a significant improvement in acoustic prediction methods for aircraft with USB type flaps. The method includes scaling factors for engine size, thrust, aircraft size, and other parameters. Finally, noise and vibration levels were predicted on a small STOL aircraft and later compared to measured data. Author

N82-22170# Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.

GUNFIRE BLAST PRESSURE PREDICTIONS

R. M. Munt, A. J. Perry, and S. A. Moorse *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 20 p refs

Avail: NTIS HC A11/MF A01

A scheme for predicting the blast pressures from aircraft guns is presented which extends existing theory. The predictions correlate well with some experimental measurements of gun blast pressures in free space. Blast pressures were also measured experimentally on a surface in the vicinity of the muzzle of a 7.62 mm rifle but these could only be satisfactorily predicted in regions where the classical theory of regular reflection of shock waves could be applied. These results are discussed in relation to the surface blast pressures from aircraft mounted guns. Author

N82-22171# Grumman Aerospace Corp., Bethpage, N.Y.

DEVELOPMENT OF A TAPED RANDOM VIBRATION TECHNIQUE FOR ACCEPTANCE TESTING

John Devitt, Richard Pokalius, Joseph Popolo, and Eugene Baird *In* AGARD Dyn. Environ. Qualification Tech. Dec. 1981 8 p

Avail: NTIS HC A11/MF A01

The use of random vibration as a screen for latent workmanship problems normally found in avionic equipment, proved to be significantly more effective than the sinusoidal form of excitation normally employed. This was demonstrated and is now required for acceptance testing by various DoD agencies. The results of a program to develop an economical technique for generating random vibration utilizing an audio tape deck indicate that compensating factors can be developed to account for the variations that exist in generically identical equipment. Using these factors, synthetic random tapes were generated. Author

N82-22172# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

MAINTENANCE IN SERVICE OF HIGH TEMPERATURE PARTS

Jan. 1982 182 p refs Meeting held at Noordwijkerhout, Netherlands, 27 Sep. - 2 Oct. 1981

(AGARD-CP-317) Avail: NTIS HC A08/MF A01

The problem areas in the inspection, repair, and life extension and prediction of gas turbine engine parts are addressed.

N82-22173# Ministry of Defence, London (England).

MILITARY MAINTENANCE POLICIES AND PROCEDURES FOR HIGH-TEMPERATURE PARTS. WILL THEY BE ADEQUATE?

R. B. G. Hedgecock *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 7 p refs

Avail: NTIS HC A08/MF A01

The problems involved in developing engine parts maintenance policies which incorporate life estimation, inspection, repair and containment of costs are examined. Computer-based engine usage monitoring systems and a low cycle fatigue counter are described along with assembled and unassembled engine inspection procedures and repair techniques. M.G.

N82-22174# Dayton Univ., Ohio. Graduate Materials Engineering Program.

ENGINE DEPOT MAINTENANCE REPAIR TECHNOLOGY

James A. Snide and William J. Schulz (AFWAL) *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 19 p refs

Avail: NTIS HC A08/MF A01

The scope and mission of the two USAF engine Air Logistics Centers are described. The various processes and organizational structure to identify repair technology requirements are discussed. Approaches to transition and implementation of new technology into a repair depot environment are described. Specific examples of technology developments described are: braze repair, laser metrology, electrophoretic, coatings, sputtered MCrAlY overlay coating and inlet guide vane vibration damping. Author

N82-22175# Naval Aircraft Materials Lab., Fleetlands (England).

MAINTENANCE PROBLEMS IN GAS TURBINE COMPONENTS AT THE ROYAL NAVAL AIRCRAFT YARD, FLEETLANDS

F. J. Plumb *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 13 p refs

Avail: NTIS HC A08/MF A01

The work of the engine repair facility at Fleetlands and the major problems found in the overhaul and repair of helicopter and marine gas turbines are discussed. Remedies for component reserviceability, developments to obtain longer service lives, and the techniques employed are discussed. Author

N82-22176# KLM Royal Dutch Airlines, Amsterdam (Netherlands). Propulsion Systems Dept.

MAINTENANCE EXPERIENCE WITH CIVIL AERO ENGINES

J. Ph. Streebach *In* AGARD Maintenance in Serv. of High Temp. Parts Jan. 1982 3 p

Avail: NTIS HC A08/MF A01

The trends in high temperature parts maintenance concept developments are reviewed, indicating the constant activities to optimize the maintenance cost of the propulsion system. As a result of the escalating trends in material and fuel prices, the presently applied maintenance concepts require a more sophisticated condition control in order to comply with the need to find the optimum operating time of each individual engine. With the introduction of the new generation of civil aircraft (Airbus A310) a mutual goal between the engine manufacturer and the airline was defined to develop mathematical programs, based on actual recorded conditions, in order to control the behavior of the engine, aiming at an optimum use of the propulsion system. M.G.

N82-22177# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.

ENGINE COMPONENT RETIREMENT FOR CAUSE

J. A. Harris, Jr., C. G. Annis, Jr., M. C. VanWanderham, and D. L. Sims *In* AGARD Maintenance in Serv. of High Temp. Parts

GTD ANALYSIS OF AIRBORNE ANTENNAS RADIATING IN THE PRESENCE OF LOSSY DIELECTRIC LAYERS Semiannual Report

R. G. Rojas-Teran and W. D. Burnside Aug. 1981 113 p refs
(Grant NsG-1498)
(NASA-CR-168770; NAS 1.26:168770; ESL-710964-8) Avail: NTIS HC A06/MF A01 CSCL 20N

The patterns of monopole or aperture antennas mounted on a perfectly conducting convex surface radiating in the presence of a dielectric or metal plate are computed. The geometrical theory of diffraction is used to analyze the radiating system and extended here to include diffraction by flat dielectric slabs. Modified edge diffraction coefficients valid for wedges whose walls are lossy or lossless thin dielectric or perfectly conducting plates are developed. The width of the dielectric plates cannot exceed a quarter of a wavelength in free space, and the interior angle of the wedge is assumed to be close to 0 deg or 180 deg. Systematic methods for computing the individual components of the total high frequency field are discussed. The accuracy of the solutions is demonstrated by comparisons with measured results, where a 2 lambda by 4 lambda prolate spheroid is used as the convex surface. A jump or kink appears in the calculated pattern when higher order terms that are important are not included in the final solution. The most immediate application of the results presented here is in the modelling of structures such as aircraft which are composed of nonmetallic parts that play a significant role in the pattern. S.L.

N82-22478*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

A PORTABLE, LOW-COST FLIGHT-DATA MEASUREMENT AND RECORDING SYSTEM

Robert J. Miller Mar. 1982 18 p refs
(NASA-TM-84229; A-8871; NAS 1.15:84229) Avail: NTIS HC A02/MF A01 CSCL 14E

The design of and the experience with an inexpensive, hand-portable, onboard data system used to record four parameters in the final portion of the landing approach and touchdown of an airplane are described. The system utilized a high-quality audio tape recorder and amateur photographic equipment with accessory circuitry rather than specialized instrumentation to given satisfactory results. Author

N82-22499# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.

PROTOTYPE FLYWHEEL SPIN TESTING PROGRAM Final Report, 21 Mar. 1980 - 15 Apr. 1981

D. W. Rabenhorst and W. O. Wilkinson Apr. 1981 59 p refs
Prepared for California Univ., Livermore. Lawrence Livermore Lab.
(Contract W-7405-eng-48)
(UCRL-15381; SDO-5988) Avail: NTIS HC A04/MF A01

Flywheels were spin tested to determine for each flywheel (1) the rotational speed at flywheel failure and (2) within the capability of the facility, the initiation and mode of failure of the flywheel. The flywheel tested ranged in size from 12.0 to 24.0 inches diameter; in weight from 5.0 to 28.5 pounds, and in energy at failure up to 711 watt hours. M.D.K.

N82-22808# National Aerospace Lab., Amsterdam (Netherlands). Wetenschappelijke Diensten Hoofdafdel.

CALCULATION OF THE CONTRIBUTIONS OF AIR TRAFFIC AND ROAD TRAFFIC TO AIR POLLUTION IN THE REGION OF SCHIPHOL AIRPORT IN 1974

J. J. Tiggelaar Oct. 1981 51 p refs In DUTCH; ENGLISH summary Sponsored by Netherlands Ministerie van Volksgezondheid en Milieuhygiene
(NLR-TR-77100-U) Avail: NTIS HC A04/MF A01

Annual and quarterly averages of CO, NOx and CxHy concentrations in the Schiphol airport region are calculated using a mathematical model. The method models traffic into a set of line and point sources with constant emission. For CO and NOx the road traffic contribution to air pollution is largest, while for CxHy the air traffic contribution is largest. The measurements suggest that other sources contribute at least as much to global air pollution as do road and air traffic. Author (ESA)

N82-22848*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THE 1981 DIRECT STRIKE LIGHTNING DATA

Felix L. Pitts and Mitchel E. Thomas Mar. 1982 40 p refs
(NASA-TM-83273; NAS 1.15:83273) Avail: NTIS HC A03/MF A01 CSCL 04B

Data waveforms obtained during the 1981 direct strike lightning tests, utilizing the NASA F-106B aircraft specially instrumented for lightning electromagnetic measurements are presented. The aircraft was operated in a thunderstorm environment to elicit strikes. Electromagnetic field data were recorded for both attached lightning and free field excitation of the aircraft. N.W.

N82-22947*# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.

THE ROLE OF COHERENT STRUCTURES IN THE GENERATION OF NOISE FOR SUBSONIC JETS Yearly Progress Report, 1 Nov. 1980 - 31 Oct. 1981

Gerald L. Morrison 5 Apr. 1982 109 p refs
(Grant NAG1-112)
(NASA-CR-168764; NAS 1.26:168764) Avail: NTIS HC A06/MF A01 CSCL 20A

The coherent structure in high Reynolds number (184,000 to 262,000), Mach number 0.6 to 0.8 axisymmetric cold air jets exhausting at atmospheric pressure was studied. The mean flow and the statistical time averaged turbulence properties were measured. Spectra showed a very broad frequency content which shifted towards the lower frequencies as the flow progressed downstream. Axial wave number measurements indicate that the axial wave number-frequency relationship was the same for a wide range of Mach (0.3 to 2.5) and Reynolds (3,700 to over 200,000) numbers. Measurements of the azimuthal mode numbers show that several modes from n = -3 to +3 exist simultaneously in various quantities that the different frequencies studied. Acoustic measurements were made in the near field of the Mach number 0.6 jet. Sound pressure level contours showed that noise appeared to be radiated from a location near the end of the potential core. Directivity plots revealed that the spectra of this noise shifted towards higher frequencies as the angle from the jet axis increased. It was also found that mid-band excitation frequencies produced an increase in full spectrum noise. M.G.

N82-22949*# Kentron International, Inc., Hampton, Va.

PROGRAM FOR NARROW-BAND ANALYSIS OF AIRCRAFT FLYOVER NOISE USING ENSEMBLE AVERAGING TECHNIQUES

Doreen Gridley Mar. 1982 70 p refs
(Contract NAS1-16000)
(NASA-CR-165867; NAS 1.26:165867) Avail: NTIS HC A04/MF A01 CSCL 20A

A package of computer programs was developed for analyzing acoustic data from an aircraft flyover. The package assumes the aircraft is flying at constant altitude and constant velocity in a fixed attitude over a linear array of ground microphones. Aircraft position is provided by radar and an option exists for including the effects of the aircraft's rigid-body attitude relative to the flight path. Time synchronization between radar and acoustic recording stations permits ensemble averaging techniques to be applied to the acoustic data thereby increasing the statistical accuracy of the acoustic results. Measured layered meteorological data obtained during the flyovers are used to compute propagation effects through the atmosphere. Final results are narrow-band spectra and directivities corrected for the flight environment to an equivalent static condition at a specified radius. R.J.F.

N82-22952*# Bolt, Beranek, and Newman, Inc., Canoga Park, Calif.

ANALYTICAL PREDICTION OF THE INTERIOR NOISE FOR CYLINDRICAL MODELS OF AIRCRAFT FUSELAGES FOR PRESCRIBED EXTERIOR NOISE FIELDS. PHASE 2: MODELS FOR SIDEWALL TRIM, STIFFENED STRUCTURES AND CABIN ACOUSTICS WITH FLOOR PARTITION

L. D. Pope and E. G. Wilby Apr. 1982 212 p refs
(Contract NAS1-15782)
(NASA-CR-165869; NAS 1.26:165869) Avail: NTIS HC A10/MF A01 CSCL 20A

An airplane interior noise prediction model is developed to determine the important parameters associated with sound transmission into the interiors of airplanes, and to identify apropriate noise control methods. Models for stiffened structures, and cabin acoustics with floor partition are developed. Validation studies are undertaken using three test articles: a ring stringer stiffened cylinder, an unstiffened cylinder with floor partition,

and ring stringer stiffened cylinder with floor partition and sidewall trim. The noise reductions of the three test articles are computed using the theoretical models and compared to measured values. A statistical analysis of the comparison data indicates that there is no bias in the predictions although a substantial random error exists so that a discrepancy of more than five or six dB can be expected for about one out of three predictions.
S.L.

N82-22963# National Aerospace Lab., Tokyo (Japan). Noise and Emission Research Group.

AERODYNAMIC NOISE GENERATED BY JET-WING/FLAP INTERACTIONS OF THE EXTERNAL USB CONFIGURATION OF STOL AIRCRAFT. PART 1: EIGHT PERCENT SCALE COLD-FLOW MODEL ANALYSIS

Masatcka Maita and Shigemi Shindo Oct. 1981 29 p refs (NAL-TR-685T; ISSN-0389-4010) Avail: NTIS HC A03/MF A01

The acoustic characteristics of the external upper surface blowing (USB) concept of a powered high lift system (PHLS) were studied experimentally using an 8%-scale static cold flow model. Observations of exhaust jet flow attachment and spreading characteristics on wing/flap surface were also carried out using several flow visualization techniques. Noise reduction data were obtained by optimizing basic jet nozzle wing/flap structural geometries for the lowest noise. Among the associated parameters which define USB-PHLS configurations, (1) the location relative to wing/flap and the shape of the exhaust jet nozzle and (2) flow attachment devices are important parameters. Flow characteristics dependence on these parameters and PHLS noise were also obtained. From far field noise spectra overall sound pressure level dependence on jet velocity and coherence across near field surface pressure, it was concluded tht the flap trailing edge noise was the most predominant noise source. Several acoustically treated flaps and serrated trailing edge design techniques were applied to attenuate edge noise.
Author

N82-22965*# DyTec Engineering, Inc., Long Beach, Calif.

RECOMMENDATIONS FOR FIELD MEASUREMENTS OF AIRCRAFT NOISE Final Report

Alan H. Marsh Washington NASA Apr. 1982 94 p refs (NASA-CR-3540; NAS 1.26:3540) Avail: NTIS HC A05/MF A01 CSCL 20A

Specific recommendations for environmental test criteria, data acquisition procedures, and instrument performance requirements for measurement of noise levels produced by aircraft in flight are provided. Recommendations are also given for measurement of associated airplane and engine parameters and atmospheric conditions. Recommendations are based on capabilities which were available commercially in 1981; they are applicable to field tests of aircraft flying subsonically past microphones located near the surface of the ground either directly under or to the side of a flight path. Aircraft types covered by the recommendations include fixed-wing airplanes powered by turbojet or turbofan engines or by propellers. The recommended field-measurement procedures are consistent with assumed requirements for data processing and analysis.
R.J.F.

N82-22966# New South Wales Univ., Sydney (Australia). School of Mechanical Engineering.

ACOUSTIC EMISSION FROM FREE JETS

S.-L. Hall *In* Ecole Centrale de Lyon Euromech 142: Acoustics of Turbulent Flows 1981 4 p

Avail: NTIS HC A08/MF A01

Nozzle centered radiation, wider spaced waves, and low angle waves are seen in correctly expanded supersonic jets. In working conditions, shock jet interaction, resulting from incorrect expansion, generates additional high frequency noise. Underexpanded jets emit more noise than overexpanded jets, due to operating at higher Mach numbers and oscillations of the shock cells. Shadowgraphs and Schlieren photographs show that helium jets have larger angles and greater extent of noise radiation than air jets. Mathematical models for correctly expanded supersonic air jets exhausting into the quiescent atmosphere, given no extraneous shocks near the nozzle exit, calculate acoustic wave angles to within 3 deg of measured values. Similar accuracy is achieved for helium jets when the ratio of acoustic impedances is used to correct the air jet values for refraction and convection effects. Models give reasonably good prediction of wave angles from + or - 50% of the correct expansion. For jets without extraneous shocks, when correctly expanded, calculated angles are within 4 deg of measured values.
Author (ESA)

N82-22967# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Berlin (West Germany). Abt. Turbulenzforschung.

PREDICTION OF FLYOVER JET NOISE SPECTRA FROM STATIC TESTS

Ulf Michel and Alfons Michalke (Technische Univ., Berlin) *In* Ecole Centrale de Lyon Euromech 142: Acoustics of Turbulent Flows 1981 4 p refs

Avail: NTIS HC A08/MF A01

A scaling law for predicting the overall flyover noise of a single stream shock-free circular jet from static experiments is outlined. It is valid for isothermal and hot jets. It assumes that the jet flow and turbulence field are axially stretched in flight. Effects of the boundary layer within the nozzle and along the engine nacelle are neglected. The scaling laws for the power spectral density and spectra with constant relative bandwidth can be derived. In order to compare static and inflight directivities, the far field point relative to the source position must be denoted by the emission angle and the wave normal distance. From the solution of the convective Lighthill equation in a coordinate system fixed to the jet nozzle (wind tunnel case), the power spectral density of sound pressure at a given frequency is found. Predictions for Aerotrain compare well with measured values.
Author (ESA)

N82-22976# Societe Nationale Industrielle Aerospatiale, Toulouse (France).

AIRCRAFT AERODYNAMIC NOISE DURING APPROACH [BRUIT AERODYNAMIQUE DES AVIONS EN APPROCHE]

J. L. Parent *In* Ecole Centrale de Lyon Euromech 142: Acoustics of Turbulent Flows 1981 3 p In FRENCH

Avail: NTIS HC A08/MF A01

The effect of approach velocity, nose and flap inclination, and undercarriage position on aircraft noise was studied. The A 300 B and SN 601 aircraft made two approach passes over a chain of noise recorders. The sound fields and noise spectra show that increasing the speed and flap angle or lowering the undercarriage produces a general increase in noise level such that the directivity of the aerodynamic noise source is hardly changed. All noise spectra increase. Pure frequencies (400 to 500 Hz) accompany flap deployment for the SN 601.
Author (ESA)

N82-22978# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany).

EXPERIMENTS ON PROPELLER NOISE

F. R. Grosche and H. Stiewitt *In* Ecole Centrale de Lyon Euromech 142: Acoustics of Turbulent Flows 1981 4 p refs

Avail: NTIS HC A08/MF A01

Propeller sound generation was investigated. Tests were performed at flow velocities up to 58 m/sec on 90 cm dia. four bladed propellers driven by an electric motor enclosed in a streamlined nacelle. Five models with different blade geometries were tested at helical tip Mach numbers up to 0.69. Nearfield blade tip measurements were made at 0.14 dia. by an in-flow microphone. The acoustic far field was measured by four microphones outside the wind tunnel flow 2.7 m from the propeller axis. An acoustic mirror telescope with three microphones was used to investigate sound generation from the upper, central and lower parts of the propeller. The spectrum in the propeller plane is dominated by the tonal components at the blade passing frequency and its harmonics. Tonal component amplitude is greatly reduced downstream. The blades radiate high frequency noise mainly in motion direction.
Author (ESA)

N82-22980# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Technische Akustik.

GROUND REFLECTION EFFECTS IN MEASURING PROPELLER AIRCRAFT FLYOVER NOISE

Werner Dobrzynski Aug. 1981 86 p refs In GERMAN; ENGLISH summary Report will also be announced as (ESA-TT-742)
(DFVLR-FB-81-28; ESA-TT-742) Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 21

In measuring flyover noise for purposes of propeller aircraft noise certification, microphones are positioned 1.2 m above the ground. The influence of ground reflection on the maximum A weighted aircraft noise level was investigated. Ground reflection induces level differences of up to 3 db (A), depending on rotational

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HISTORICAL PERSPECTIVES ON THERMOSTRUCTURAL RESEARCH AT THE NACA LANGLEY AERONAUTICAL LABORATORY FROM 1948 TO 1958

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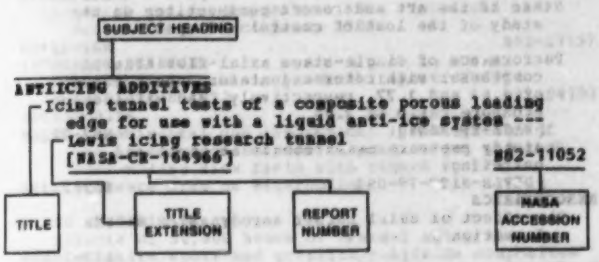
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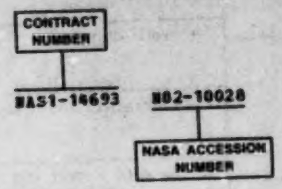

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A82-31980 # **The potential of large aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, CA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0804.* 6 p.

The present investigation is concerned with two designs of unconventional aircraft, both very much larger than existing equipment. One of the two designs, implemented by the Surface Effect Aircraft (SEA), takes advantage of the increase in lift/drag (L/D) which results from flying very close to the surface. In connection with their size, the vehicles were designed to operate as flying boats. It was recognized that their principal operational mode would be in transocean service, providing '125 knot sea lift'. At a takeoff gross weight of 1.8 million pounds one of the considered SEA is capable of carrying 810,000 pounds of payload a distance of 3450 nautical miles. Attention is also given to a study regarding the largest aircraft anyone might conceivably build, taking into account the conceptual design of a nuclear-powered aircraft which weighed nearly 12 million pounds. A military situation was conceived in which such aircraft might be used. G.R.

A82-31981 # **Aircraft carrier - Surface effect ship.** D. P. Germeraad (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0808.* 12 p. 5 refs.

Conventional ships encounter at high speeds a wave-making drag phenomenon which increases roughly as the cube of the velocity. The Surface Effect Ship (SES) concept alleviates this deficiency by permitting the ship to ride on a cushion of air. This cushion is created by large vertical-axis fans, which are contained between twin catamaran hulls and pliant seals fore and aft. These seals are essentially transparent to wave passage. Speeds on the order of 100 knots can thus be realized. A summary is provided of developments related to two aircraft carrier SES design contracts. Attention is given to basic SES design criteria, the definition and feasibility study of a minimum size SES aircraft carrier (SES-CV), aspects of SES-CV conceptual design, and CTOL aircraft carrier options. G.R.

A82-31982 # **Considerations for international joint venture development of very large aircraft.** W. A. Garrett (Lockheed-Georgia Co., Marietta, GA) and H. Liese (Dornier GmbH, Friedrichshafen, West Germany). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0809.* 10 p. 5 refs.

Attention is given to a joint international civilian-military venture for the development of a common aircraft that will satisfy the growing mutual defense objectives and commercial interests of both the U.S. and the respective European NATO countries. The high costs involved in the development and manufacture of an advanced-technology, fuel efficient, transport aircraft for the considered applications make it imperative to find an approach in which these costs are distributed among a number of partners. A description is presented of an investigation conducted by an American and a European aerospace company, relative to the prospects for a joint U.S./European NATO cooperative aircraft venture. The decision of the two companies to conduct this investigation is based on a long-standing interest in Very Large Aircraft concepts. G.R.

A82-31983 * # **Multibody transport concept.** J. W. Moore (Lockheed-Georgia Co., Marietta, GA) and D. V. Maddalon (NASA, Langley Research Center, Laminar Flow Control Projects Office, Hampton, VA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0810.* 13 p. 8 refs.

Two baseline aircraft are configured in this study. The multibody aircraft has two fuselage bodies located at approximately 28% wing semispan. The single-body aircraft is configured in such a way as to provide a reference base with which the multibody aircraft can be compared. The aircraft are sized to provide the lowest direct operating cost configuration when transporting 771,620 lbs. over a distance of 3,500 nautical miles at a cruise speed of Mach 0.80. The aircraft are assumed to operate in the years 1990-1995, thus allowing for the incorporation of those technologies expected to be mature and available for production usage in 1985. In comparison with the single-body aircraft, the two-body aircraft shows reductions of 8.9% in wing weight, 7.7% in structural weight, 13.5% in block fuel weight, and 11.3% in direct operating cost. C.R.

A82-31984 * # **Solar-powered airplane design for long-endurance, high-altitude flight.** J. W. Youngblood and T. A. Talay (NASA, Langley Research Center, Space Systems Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0811.* 10 p. 24 refs.

This paper describes the performance analysis and design of a solar-powered airplane for long-endurance, unmanned, high-altitude cruise flight utilizing electric propulsion and solar energy collection/storage devices. For a fixed calendar date and geocentric latitude, the daily energy balance, airplane sizing, and airplane aerodynamics relations combine to determine airplane size and geometry to meet mission requirements. Vehicle component weight loadings, aerodynamic parameters, and current and projected values of power train component characteristics form the basis of the solution. For a specified mission, a candidate airplane design is presented to demonstrate the feasibility of solar-powered long endurance flight. Parametric data are presented to illustrate the airplane's mission flexibility. (Author)

A82-31985 # **System study of application of composite materials for future transport aircraft.** R. H. Lange and J. W. Moore (Lockheed-Georgia Co., Marietta, GA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0812.* 7 p. 13 refs.

The application of advanced technologies shows the potential for significant improvement in the fuel efficiency of future transport aircraft envisioned for operations in the mid to late 1990s. This paper reviews recent preliminary design system studies of advanced civil/military transport aircraft featuring cost/benefit analysis of advanced technology. Emphasis is directed toward the use of graphite/epoxy composite materials in the primary and secondary structures of transport aircraft. The aircraft design parameters include cruise Mach number of 0.80, design payload of 330,000 pounds, and 3,500 nautical miles range. (Author)

A82-31986 # **Very large aircraft with alternate fuels - LH2 most promising.** J. C. Muehlbauer (Lockheed-Georgia Co., Marietta, GA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0813.* 10 p. 7 refs.

Optimum designs of cargo aircraft using alternate fuels and carrying large payloads roundtrip over transoceanic distances without refueling are developed and compared. Synthetic jet propulsion (JP) fuel, liquid hydrogen (LH2) fuel, and nuclear power are considered. In relation to the JP aircraft, the LH2 aircraft is found to have lower ramp weights (by 25%) and lower trip costs (15%). The ramp weights and trip costs of the nuclear aircraft are, respectively, approximately 5 and 20% higher than those for the JP aircraft. With JP aircraft trip costs the most sensitive to fuel price, it is believed that rising prices in the future will make LH2 and nuclear power increasingly attractive. C.R.

A82-31987 # **The potential for long-range high-payload aircraft with alternate fuels.** W. M. Hawkins (Lockheed Corp., Burbank, CA). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0814.* 7 p. 5 refs.

It is assumed that these aircraft will not be produced until the year 2005 and that they will use liquid hydrogen, which can be produced using coal, natural gas, or any other source of energy and water. With regard to propulsion, the present size of modern high-by-pass engines will be employed; between 6 and 12 such units will be used on each aircraft. Control systems in use today to relieve structural loads will figure in the design, as will controls to avoid flutter, which at present are under development. Also considered possible is the use of precision rendezvous. It is pointed out that the cooling capacity of the liquid hydrogen fuel may be able to maintain laminar flow over a substantial portion of the aircraft by surface cooling. C.R.

A82-31988 # **Beyond 2000 - The airlift challenge ahead.** W. T. Stallings (USAF, Military Airlift Command, Scott AFB, IL). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0815.* 6 p. 16 refs.

This paper discusses the present course and current concerns of the U.S. aviation industry. The paper suggests that the future strength of the industry could be enhanced through civil-military commonality and international cooperative agreements. A strong national air transportation policy is also advocated as a means to revitalize the industry. (Author)

A82-31991 **A system design for a multispectral sensor using two-dimensional solid-state imaging arrays.** R. M. Hodgson (Canterbury, University, Christchurch, New Zealand), F. M. Cady (Montana State University, Bozeman, MT), and D. Pairman (Department of Scientific and Industrial Research, Physics and Engineering Laboratories, Lower Hutt, New Zealand). *IEEE Transactions on Geoscience and Remote Sensing,* vol. GE-20, Apr. 1982, p. 177-179. 7 refs. Research supported by the University of Canterbury and University Grants Committee.

A system developed for remote sensing from light aircraft in the 400-1100 nm wavelength range possesses an architecture which permits the simultaneous capture of up to four images from solid-state, two-dimensional image sensors. In operation, the array sensor captures a series of relatively rapid, approximately 10 msec exposures at intervals as long as 10 sec. This mode of operation has the advantage of nearly the same degree of distortion due to aircraft roll in all image elements. The software generation of sensor drive signals is incorporated in the system. O.C.

A82-31999 **Army's 1st IPI program begun - Blisk impeller followup.** A. E. Goldberger (McDonnell-Douglas Corp., St. Louis, MO). *ManTech Journal,* vol. 6, no. 4, 1981, p. 6-14. Army-supported research.

A description is given of the performance-enhancement and manufacturing cost-reduction advantages of the blisk, or integral blade-disk, method of axial and centrifugal compressor rotor construction exemplified by the T700 helicopter engine. The five axial stages and single centrifugal stage of the T700 compressor rotor achieves a 15:1 compression ratio, by comparison to the 8:1 ratio of the T58 engine compressor. The blisk manufacturing approach is embodied in a single, integrated manufacturing center which employs numerical control equipment for all fabrication steps. These steps include the machining of forgings to within 0.125 in of their rectilinear configuration, ultrasonic and magnaflux inspection, and finish turning on a numerically-controlled slant bed turret lathe. Attention is given the novel technique of abrasive flow machining for final airfoil finishing. O.C.

A82-32055 **Recent developments in aviation cases.** D. L. Campbell and D. K. Cherry. *Journal of Air Law and Commerce,* vol. 47, Fall 1981, p. 1-52. 342 refs.

Aviation court case decisions in 1980 are reviewed. The trend was strongly in favor of defendants, especially manufacturers and component manufacturers, with several successful motions for summary judgment. Defendants were also very often successful in enforcing contractural waivers between parties of relatively equal status. Numerous cases involved implied causes of action arising out of aviation statutes, and the trend toward enforcement of the Warsaw Convention's technical requirements continued. There were further cases alleging U.S. negligence in the publication of aeronautical charts. The courts continued to enforce coverage limitations and exclusions in aviation insurance policies. Numerous interesting decisions in the area of conflict of laws were handed down, most of them dealing with areas of great activity such as the offshore North Sea exploration and drilling operations. C.D.

A82-32056 **Predicting the application of vicarious liability to fixed base operators - Still guesswork after all these years.** L. S. Kaplan. *Journal of Air Law and Commerce,* vol. 47, Fall 1981, p. 53-89. 168 refs.

A82-32059 **Aviation accident investigation - Functional and legal perspectives.** C. O. Miller (System Safety, Inc., McLean, VA). *Journal of Air Law and Commerce,* vol. 46, Winter 1981, p. 237-293. 187 refs.

The legislative history of aviation accident investigation, current rules and procedures in investigation, probable cause in investigation and the law, and problems in investigation in relation to law and society are discussed. The Federal Aviation Act of 1958, Department of Transportation Act of 1966, Independent Safety Board Act of 1974, Federal Tort Claims Act, Freedom of Information Act, Federal Advisory Committee Act, Privacy Act, Government in the Sunshine Act, and Airline Deregulation Act are discussed in terms of their effect on accident investigation. The various rules promulgated in the area are detailed. The distinction between factual and legal cause is discussed in terms of its influence on accident investigation, particularly the problem of multiple causation. Finally, problems of openness of investigation are assessed. C.D.

A82-32062 **Factors influencing settlement of personal injury and death claims in aircraft accident litigation.** R. R. Craft, Jr. (Haight, Gardner, Poor and Havens, New York, NY). *Journal of Air Law and Commerce,* vol. 46, Summer 1981, p. 895-940. 84 refs.

The Tenerife accident (March 1977) is used as a reference point in a discussion of settlement of aircraft accident litigation. The topics discussed include gathering information and contacting clients; initial role of plaintiffs' attorneys; setting up funds and making offers; multidistrict litigation and narrowing of issues; forum non conveniens; punitive damages; prejudgement interest; the roles of the judge and the attorneys for both sides; settlement negotiations; and attorneys' fees. C.D.

A82-32063 **Aviation negotiations and the U.S. model agreement.** R. W. Bogosian (U.S. Department of State, Office of Aviation, Washington, DC). *Journal of Air Law and Commerce,* Summer 1981, p. 1007-1037. 52 refs.

As historical background, the development from the liberal post-World War II Bermuda I bilateral aviation agreement to the restrictive Bermuda II agreement of 1977 is traced. The U.S. model agreement (the text of which is included) is then discussed. The 'doing business' provisions provide both parties with fair and equal opportunity to compete, and require that unfair competitive practices and discriminations be removed. One article requires complete operational freedom, subject to customs or other technical constraints. The pricing article calls for mutual disapproval pricing based upon market considerations and limits intervention to prevention of predatory or discriminatory pricing, protection of consumers from excessively high prices and of airlines from excessively low ones. The opposition of foreign aviation leaders is discussed and present achievements and future prospects are assessed. C.D.

A82-32135 **A unified and generalized definition of static longitudinal stability in aircraft (Zur Vereinheitlichung und Verallgemeinerung des Begriffs der statischen Stabilität von Fluggeräten).** R. Staufenbiel (Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 6, Mar.-Apr. 1982, p. 74-80. 10 refs. In German.

The static stability of vibrational modes is mathematically analyzed. Equations are derived for static stability conditions that ignore Mach number and altitude, and then equations that include them are derived. A general procedure for obtaining the conditions necessary for longitudinal stability is demonstrated. C.D.

A82-32136 **Parameter identification for structures with neighboring natural frequencies especially for the case of flight resonance tests (Parameteridentifikation bei Strukturen mit benachbarten Eigenfrequenzen, speziell bei Flugschwingungsversuchen).** H. Wittmeyer. *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 6, Mar.-Apr. 1982, p. 80-90. 8 refs. In German.

A procedure to be used for linear vibrating systems that are viscously or structurally damped, especially where the eigenfrequencies are neighbors, is developed. The procedure is applied to a sample vibrational system with viscous damping whose symmetries have no unusual characteristics, such as a vibration test in a wind tunnel. Structural amplitudes are evaluated at several points and for several exciting frequencies. These amplitudes are the structural solutions for harmonic excitation by a set of forces whose amplitude general weakness in the forward swept configurations was found compared to aft swept ones. D.L.G.

A82-34498 # Automatic checking of measuring units in the Modane wind tunnels. X. Bouis, G. Gavet, and R. Combaz (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Supersonic Tunnel Association, Meeting, Seattle, WA, Mar. 29, 30, 1982.) ONERA, TP* no. 1982-10, 1982. 10 p.

Hardware and software means are implemented to improve measurement accuracy, to accelerate test runs and to detect errors or failures in measuring units in Modane wind tunnels. These improvements allow the correct settings of the gains and cut-off frequencies of amplifiers and filters to be checked at regular intervals, in addition to the calibration of analog-to-digital converters. Signals are applied to the measuring unit, which, after amplification, should give voltages of -9, -6, -3, 0, 3, 6, 9, and 0 V to the converter terminals. The result is correct if the deviation does not exceed plus or minus 2 mV, except around zero, where it is required to respect the limits of plus or minus 1 mV. The overall precision of the measuring unit exceeds the range of plus or minus 0.00021. D.L.G.

A82-34499 # Aircraft potential variations in flight. J. L. Boulay and P. Laroche (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(International Aerospace Conference on Lightning and Static Electricity, Oxford University, Oxford, England, Mar. 23-25, 1982.) ONERA, TP* no. 1982-11, 1982. 20 p. 21 refs. Research supported by the Direction des Recherches, Etudes et Techniques.

Some airborne experiments have been achieved in order to study the electrostatic behavior of an aircraft in flight. Variations of triboelectric current and potential of the aircraft were recorded in different atmospheric configurations. Some passive dischargers arrangements on the aircraft structure have been also characterized. (Author)

A82-34536 The initial lift and drag of an impulsively started airfoil of finite thickness. C.-Y. Chow and M.-K. Huang (Colorado, University, Boulder, CO). *Journal of Fluid Mechanics*, vol. 118, May 1982, p. 393-409. 10 refs. Grant No. AF-AFOSR-81-0037.

An apparent masses formulation for an airfoil-shed vortex sheet combination is employed to model the initial lift and drag of an airfoil started impulsively from rest. The method is first applied to a flat plate to prove the accuracy and then extended to airfoils of finite thickness. Specific attention is given to the Joukowski airfoil, for which the flat plate is shown to be a special case. Further analysis is presented for a Karman-Trefftz airfoil. In the case of the Joukowski airfoil, increasing camber or angle-of-attack was demonstrated to increase the initial lift and drag, while increasing thickness caused a decrease. For the Karman-Trefftz airfoil, any finite trailinq-edge angle was found to decrease both lift and drag to zero at the starting instant. It is concluded that thicker airfoils or airfoils with large trailing edge angles tend to resist increases in lift. M.S.K.

A82-34607 * Outline of a multiple-access communication network based on adaptive arrays. S. Zohar (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *IEEE Transactions on Communications*, vol. COM-30, May 1982, pt. 2, p. 1242-1248. 7 refs. Contract No. NAS7-100.

Attention is given to a narrow-band communication system consisting of a central station trying to receive signals simultaneously from K spatially distinct mobile users sharing the same frequencies. One example of such a system is a group of aircraft and ships transmitting messages to a communication satellite. A reasonable approach to such a multiple access system may be based on equipping the central station with an n-element antenna array where n is equal to or greater than K. The array employs K sets of n weights to segregate the signals received from the K users. The weights are determined by direct computation based on position information transmitted by the users. A description is presented of an improved technique which makes it possible to reduce significantly the number of required computer operations in comparison to currently known techniques. G.R.

A82-34639 # Calculation of the lift distribution and aerodynamic derivatives of quasi-static elastic aircraft. Q. Liu, C. Wu, and Z. Jian (Northwestern Polytechnical University, Xi'an, People's Republic of China). *Acta Aeronautica et Astronautica Sinica*, vol. 3, Mar. 1981, p. 1-11. 10 refs. In Chinese, with abstract in English.

Quasi-static approximations of the aerodynamic characteristics of an elastic aircraft are undertaken by means of a numerical method, which may be used to evaluate the lift distribution and 11 main longitudinal aerodynamic derivatives of the elastic aircraft at subsonic speeds. Green's function methods are used for the aerodynamic calculations, and structural deformation is evaluated by the free structure influence coefficient method. Numerical examples are given, and dynamical problems of elastic aircraft are discussed. It is established that the derivatives employed may be directly adopted for elastic aircraft stability and control analyses. O.C.

A82-34644 # Experimental study on discharge and loss coefficients of combustor swirlers. C. Zhang (Wuxi Aircraft Engine Research Institute, Wuxi, People's Republic of China) and Y. Wang (Shenyang Liming Machinery Co., Shenyang, People's Republic of China). *Acta Aeronautica et Astronautica Sinica*, vol. 3, Mar. 1981, p. 50-57. In Chinese, with abstract in English.

Blade-type swirlers used to control primary flametube airflow in aircraft engine combustors incur losses which depend on blade stagger angle, pitch/chord ratio and blade passage area. A set of discharge characteristics and relations between loss coefficients and the parameters mentioned are given, along with the correlation of loss to discharge coefficients. It is found that the discharge coefficient varies from 0.6 to 0.9 for swirlers with different stagger angles. It is found that blade loss is smaller than secondary expansion loss for a given combustor swirler, and that the twisted blade swirler design is superior to the straight-bladed one from an aerodynamic viewpoint, offsetting its higher production costs. O.C.

A82-34645 # Aerodynamic coefficient identification of time-varying aircraft system and its application. T. Wang (China Precision Machinery Corp., Beijing Research Institute, Beijing, People's Republic of China). *Acta Aeronautica et Astronautica Sinica*, vol. 3, Mar. 1981, p. 67-76. In Chinese, with abstract in English.

It is shown, on the basis of flight test measurements and analyses of trends in the coefficients of aircraft time-varying differential equations, that it is possible to transform the individual time-varying coefficient into a known function multiplied by an unknown constant. By extending the Newton-Raphson method to the time-varying coefficient differential equations, such undefined coefficients may be evaluated through iteration calculation. This scheme is evaluated in light of data taken during unsteady flight, and the reliability of aerodynamic coefficients obtained through this identification method is discussed. Good agreement is found between calculations and test data. O.C.

A82-34671 Doppler processing, waveform design and performance measures for some pulsed Doppler and MTD-radars. II. A. Ludloff, N. Füchter, F. Hagedorn, M. Minker, and H. Rohling (Telefunken AG, Ulm, West Germany). *Ortung und Navigation*, no. 1, 1982, p. 5-54. 21 refs. Research supported by the Bundesministerium für Verkehr.

Subclutter visibility (SCV), design principles, calculation of filter transfer function, and SNR and signal-to-interference ratio (SIR) improvements are discussed. The definition of SCV, the mean detection probability as a function of SCV, SCV as a function of an average SIR improvement, approximate calculation of SCV, and processor SNR loss budget are analyzed. The design principles discussed include dynamic range versus equipment noise, pulsed oscillator versus power amplifier, transversal filter bank versus MTI-FFT processing, advantages obtained by using frequency diversity, necessity of circular polarization, and radar site selection. Filter bank with MTI and DFT, filter weights derived from a modified MLR test, weighting sequences for windows, and calculation of SNR and SIR improvements are analyzed. A practical example is given. C.D.

A82-34672 Short-term behavior of a Doppler navigation system and comparison with position indication by means of scanning radar (Kurzzeitverhalten eines Doppler-Navigationssystems und Vergleich mit Positionsbestimmungen durch ein Vermessungsradar). K. Ramsayer and G. Klaedtke (Stuttgart, Universität, Stuttgart, West Germany). *Ortung und Navigation*, no. 1, 1982, p. 125-138. In German.

A concept of integrated navigation via adjustment by the method of least squares was tested in a military aircraft. The navigation equipment of the aircraft included the Bendix DRA-12B double radar and the Sperry gyroscopic platform SYP 820 furnished with a computer integrated with TACAN and DME. The flight test results are reported. In order to test various off-line evaluation methods in addition to on-line evaluation during flight, the Doppler pulses, drift, heading, and other interesting parameters were registered. The results showed that the Doppler navigation system measurements were very 'noisy'. To determine the short-term behavior of the system, recordings were investigated for an approximately rectilinear flight of 300 seconds length. The aircraft distance, azimuth, and angle of elevation were continuously recorded by scanning radar, enabling a comparison to be made with the Doppler system. C.D.

A82-34700 Air cooling of gas turbine blades. O. N. Favorskii and S. Z. Kopelev. *(Teploenergetika, vol. 28, Aug. 1981, p. 7-11.) Thermal Engineering*, vol. 28, Aug. 1981, p. 435-438. 13 refs. Translation.

During the last 20 years, the gas temperature at the inlet of aircraft gas turbines has been raised by 450 K to a temperature of 1650 K. The achievement of the current high operational temperatures, which have led to a considerable enhancement in engine efficiency, has been largely made possible by the development of suitable approaches for cooling the gas turbine blades. The various factors involved in designing an effective cooling procedure are considered, taking into account the necessity that the involved flow processes must not result in a lowering of engine efficiency, and, in connection with large temperature gradients or the introduction of stress-raising design features, must not unduly reduce the operational life of the engine. Attention is given to the internal convective and the convection-film air cooling of blades, the promotion of flow turbulence by means of internal baffles, the hydraulic resistance of internal cooling channels, and merits and drawbacks of perforations. G.R.

A82-34737 **An optical data link for airborne scanning system.** M. J. Green (Wisconsin, University, Madison, WI). In: American Society of Photogrammetry, Annual Meeting, 47th, Washington, DC, February 22-27, 1981, ASP Technical Papers. (A82-34701 16-43) Falls Church, VA, American Society of Photogrammetry, 1981, p. 476-482.

In connection with a study of oceanic thermal fronts, the Navy is interested in a thermal scanning system which could be used with their P-3 patrol aircraft. A suitable scanning system would be the RS-18A scanning thermal IR radiometer. However, an obstacle regarding the envisaged use of the instrument is related to the necessity to employ the aircraft without an introduction of any modifications. The obstacle has been overcome by making use of an optical data link which replaces the hardwire connections between the scanner and the power supply. The optical link is housed in a ten inch diameter tube which is clamped in position directly behind the scanner head. G.R.

A82-34748 # **Mach reflection of a shock wave from an inclined wall.** T. Ikui, K. Matsuo, N. Kondoh (Kyushu University, Fukuoka, Japan), and T. Aoki. *Kyushu University, Faculty of Engineering, Memoirs,* vol. 41, Dec. 1981, p. 361-380. 24 refs.

The Mach reflection phenomena of shock waves that encounter a wall inclined to the shock are investigated over a wide range of incident Mach number and wedge angle using air, carbon-dioxide and chlorofluoro-carbon (Freon-12) as a working gas. A new type of reflection which cannot be classified as regular reflection, single-Mach, complex-Mach or double-Mach reflections is observed in Freon-12 and is called pseudo-regular reflection. An equation expressing the distance between a slip stream and a Mach shock wave along the wedge surface is proposed, and the phenomenon of the rolling-up of the slip stream is explained. An equation predicting the location of the kink point in the case of double-Mach reflection is presented, which agrees with experimental evidence better then Law's (1970) method. Transitions from single-Mach to complex-Mach reflections and complex-Mach to double-Mach reflections are explained, and a criterion of the rolling-up of the slip stream is presented. D.L.G.

A82-34772 **Measuring LF and MF antenna radiation patterns by means of a helicopter.** D. J. Bem (Wroclaw, Politechnika, Wroclaw, Poland) and E. Zemicki (Institute of Telecommunications, Wroclaw, Poland). In: Electromagnetic compatibility 1980; Proceedings of the Fifth International Wroclaw Symposium and Exhibition, Wroclaw, Poland, September 17-19, 1980. Part 2. Wroclaw, Wydawnictwo Politechniki Wroclawskiej, 1980, p. 761-739.

The paper deals with a method of measuring power gain and radiation pattern of LF and MF antennae, applying the standard field produced by a loop antenna installed on a helicopter. A method of radionavigation necessary for this purpose has been presented. Results of measurements of several antennae have also been given. (Author)

A82-34814 † **A study of the vibration loading of the turbine blades of an aircraft gas-turbine engine with dry-friction dampers (Issledovanie vibratsionnoi nagruzhennosti rabochikh lopatok turbiny aviatsionnogo GTD s dempferami sukhogo treniia).** V. M. Kapralov and R. V. Skvortsov. *Problemy Prochnosti,* May 1982, p. 83-85. In Russian.

The use of box-type dry-friction dampers in aircraft gas-turbine engines is discussed, and a method is proposed for the determination of the required damper mass. In accordance with the proposed method, the damper mass is first determined by using an approximate formula. Further studies involving amplitude and spectral analysis make it possible to evaluate the damper efficiency and finally select the damper mass. V.L.

A82-34851 # **Contact problems involving the flow past an inflated aerofoil.** J.-M. Vanden-Broeck (Stanford University, Stanford, CA). *ASME, Transactions, Journal of Applied Mechanics,* vol. 49, June 1982, p. 263-265. 10 refs. USAF-Navy-Army-NSF-supported research.

Steady potential flow around a two-dimensional inflated airfoil is considered. The aerofoil consists of a flexible and inextensible membrane which is anchored at both leading and trailing edges. The flow and the aerofoil shape are determined as functions of the angle of attack, the cavitation number, and the Weber number. When the cavitation number decreases to a critical value, opposite sides of the membrane become tangent to each other at the trailing edge. For values less than critical, the aerofoil is partially collapsed near the trailing edge. The length of the region of collapse increases as the cavitation number decreases and for a cavitation number equal to minus infinity, the aerofoil is completely collapsed. The shape of the aerofoil and the value of the critical cavitation number are determined analytically by a perturbation solution for small Weber numbers. Graphs of the results are presented. (Author)

A82-34861 # **Unconventional internal cracks. II - Method of generating simple cracks.** C. H. Wu (Illinois, University, Chicago, IL). *ASME, Transactions, Journal of Applied Mechanics,* vol. 49, June 1982, p. 383-388. 10 refs.

The meaning of the word crack is extended to include holes with cusps of vanishing cusp angle. A crack is said to be simple if the associated elasticity problem has a closed-form solution. Many classes of simple cracks are constructed and solved in this two-part paper. In particular, a method of constructing very sharp cusps is described. These cusps possess not only a zero slope (zero cusp angle) but a vanishing curvature as well. In fact, a crack may be constructed in such a way that the first N derivatives are all zero. (Author)

A82-34879 **A review and assessment of fatigue crack growth rate relationships for metallic airframe materials.** J. B. Chang, M. Szamossi, and E. Klein (Rockwell International Corp., North American Aircraft Div., Los Angeles, CA). In: Fracture and failure: Analyses, mechanisms and applications; Proceedings of the Symposium, Los Angeles, CA, March 17-20, 1980. Metals Park, OH, American Society for Metals, 1981, p. 35-54. 13 refs. Contract No. F33615-77-C-3121.

An R&D program recently undertaken by Rockwell for the U.S. Air Force is aimed at upgrading the fatigue crack growth prediction technology required for implementation of the damage tolerance control procedures throughout the life cycle of any weapon system. To accomplish this objective, it was considered necessary to review and evaluate the state-of-the-art fatigue crack growth rate equations commonly used for performing damage-tolerance analysis on airframe structures. Three such rate equations (the Boeing, Grumman, and Rockwell equations) were assessed using baseline crack growth test data. It is shown that, by properly choosing the rate constants, all three equations can be used to characterize the fatigue crack growth rate relationships for airframe materials. B.J.

A82-34882 **Failure analysis of silica phenolic nozzle liners.** M. Katcher (Marquardt Co., Van Nuys, CA). In: Fracture and failure: Analyses, mechanisms and applications; Proceedings of the Symposium, Los Angeles, CA, March 17-20, 1980. Metals Park, OH, American Society for Metals, 1981, p. 165-183.

The Marquardt Company's failure investigation of cracking in two silica phenolic nozzle liners during proof testing is described. The proof testing consisted of pressuring the nozzles to 14.1 MPa for 5 to 20 sec. It is found that the longitudinal cracking of the convergent exhaust nozzle insulators was due to the use of bad fiber/fabric material by a supplier. This material was used in the manufacture of silica phonolic tape that was later used by Marquardt's exhaust nozzle liner supplier. The bad fiber/fabric could not be distinguished by then current quality control procedures which assessed tape strength properties in the warp as opposed to the bias direction. It was also found that the introduction of the bad fiber/fabric material was the only distinctive difference between the nozzle insulators that failed and other nozzles that had successfully passed. B.J.

A82-34883 # **Large scale aeroengine compressor test facility.** *Ishikawajima-Harima Engineering Review,* vol. 22, Mar. 1982, p. 133-136. In Japanese, with abstract in English.

Installation of a test facility for large compressors has recently been completed at IHI Mizuho Plant to serve in the development of aircraft engine components. The facility comprises a driving unit (IHI-developed IM 2000 gas turbine), intake and exhaust systems for the test compressor, and a data acquisition system. It is capable of testing compressors up to 18,000 SPS (13.2 MW) with maximum speed of 13,000 rpm. The whole system has been compactly designed to be installed in a small space as compared with similar facilities constructed in the past. The data acquisition system makes full use of the latest developments in minicomputers and pressure/temperature measuring devices to provide on-line computing of the measured data for instant display of the compressor overall performance as well as detailed aerodynamic properties of the internal flow field. The system has already been utilized for the front fan model testing of the RJ 500 engine which is an Anglo-Japanese collaborative engine for the next generation civil transport and proven to be a very effective tool for the achievement of high level performance requirements. (Author)

N82-25200*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TUNNEL-TO-TUNNEL CORRELATION

Frank W. Steinle, Jr. *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 47-63 refs

Avail: NTIS HC A10/MF A01 CSCL 01A

Flow quality is discussed. Incremental comparisons of: (1) the angle of attack, (2) the axial force coefficient, and (3) the base cavity axial force coefficient against the normal force coefficient are presented. Relative blockage determination, relative buoyancy corrections, and boundary layer transition length are discussed. Blockage buoyancy caused by tunnel model wall dynamic interaction is discussed in terms of adaptive walls. The effect of 'transonic turbulence factor' is considered. N.W.

N82-25201*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

WIND-TUNNEL/FLIGHT CORRELATION PROGRAM ON XB-70-1

John B. Peterson, Jr. *In its* Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 65-91 refs

Avail: NTIS HC A10/MF A01 CSCL 01A

The XB-70-1 was selected for a wind-tunnel/flight correlation program as representative of a large, flexible supersonic airplane similar to a supersonic transport. Tests were made to determine the effects of control deflections, wing tip deflection, and variations in inlet mass flow (additive drag). N.W.

N82-25202*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PROBLEMS IN CORRELATION CAUSED BY PROPULSION SYSTEMS

Ronald H. Smith *In its* Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 93-108 ref

Avail: NTIS HC A10/MF A01 CSCL 01A

Correlation efforts and selected results for transonic drag are reviewed. A process to reduce the typical error sources to decrease the errors inherent in the transonic aircraft development process is summarized. Author

N82-25203*# McDonnell Aircraft Co., St. Louis, Mo.

F-15 WIND-TUNNEL/FLIGHT CORRELATIONS

Larry G. Niedling *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 109-115 refs

Avail: NTIS HC A10/MF A01 CSCL 01A

F-15 correlation data for longitudinal control and inlet-ramp effectiveness, and horizontal-tail setting for trim are presented. The Reynolds number effect on airfoil laminar bubble burst is included. N.W.

N82-25206*# Boeing Commercial Airplane Co., Seattle, Wash.

OPPORTUNITIES FOR WIND-TUNNEL/FLIGHT CORRELATION WITH NEW BOEING AIRPLANES

Adelbert L. Nagel *In* NASA. Langley Research Center Wind-Tunnel-Flight Correlation, 1981 Jun. 1982 p 141-157

Avail: NTIS HC A10/MF A01 CSCL 01A

The use of correlated data in airplane development is discussed. Areas of interest include initial airworthiness of an aircraft, low-speed configuration optimization, and high-speed configuration optimization. Data from wind tunnel tests are shown to be significant when applied to guarantee compliance, which includes fuel consumption, airspeeds, and takeoff and landing performance. The use of correlation in achieving FAA certification is also discussed. T.M.

N82-25207*# General Dynamics/Fort Worth, Tex.

F-16E PROGRAM OVERVIEW AND WIND TUNNEL/FLIGHT CORRELATION

A. P. Madsen *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 159-172 ref

Avail: NTIS HC A10/MF A01 CSCL 01A

Correlation is defined in three different ways: comparisons of wind tunnel and/or theory with flight results; detailed studies of total vehicle drag from wind tunnel and flight tests; and attempts to understand the fundamental mechanisms of fluid flows associated with aircraft components in specific areas of the flight environment. The F-16E configuration is an outgrowth of studies conducted to produce a refined fighter wing design. Several iterations required to arrive at the combination of wing planform, camber, and twist which gives near optimum lift, drag, and high-angle-of-attack stability. Theoretical analyses were backed up by extensive experimental data to validate the design and are presented. T.M.

N82-25209*# Grumman Aerospace Corp., Bethpage, N.Y.

X-29A FORWARD-SWEPT-WING DEMONSTRATOR AIRPLANE

Douglas R. Frei *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 177-189

Avail: NTIS HC A10/MF A01 CSCL 01A

The X-29A is a technology demonstrator. The FSW is just one of the technologies. Others include the following: discrete variable camber, relaxed static stability, triplex digital fly-by-wire (FBW) control system, variable-incidence/close-coupled canard, aeroelastically tailored composite wing, and thin supercritical airfoil. The growth potential for additional technologies is shown. T.M.

N82-25211*# Massachusetts Inst. of Tech., Cambridge.

APPLICATION OF COMPUTATIONAL FLUID DYNAMICS (CFD) IN TRANSONIC WIND-TUNNEL/FLIGHT-TEST CORRELATION

Earl M. Murman *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 199-215 refs

Avail: NTIS HC A10/MF A01 CSCL 01A

The capability for calculating transonic flows for realistic configurations and conditions is discussed. Various phenomena which were modeled are shown to have the same order of magnitude on the influence of predicted results. It is concluded that CFD can make the following contributions to the task of correlating wind tunnel and flight test data: some effects of geometry differences and aeroelastic distortion can be predicted; tunnel wall effects can be assessed and corrected for; and the effects of model support systems and free stream nonuniformities can be modeled. T.M.

N82-25214*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ELASTIC DEFORMATION EFFECTS ON AERODYNAMIC CHARACTERISTICS FOR A HIGH-ASPECT-RATIO SUPERCRITICAL-WING MODEL

Judith J. Watson May 1982 26 p refs

(NASA-TM-83286; L-15098; NAS 1.15:83286) Avail: NTIS HC A03/MF A01 CSCL 01A

The results of an investigation of the deformations of a high-aspect-ratio, force/pressure, supercritical-wing model during wind tunnel tests and the effects these deformations have on the wing aerodynamics are presented. A finite element model of the wing was developed, and then, for conditions corresponding to wind tunnel test points, experimental aerodynamic loads and theoretical aerodynamic loads were applied to the finite element model. Comparisons were made between the results of these load conditions for changes in structural deflections and for changes in aerodynamic characteristics. The results show that the deformations are quite small and that the pressure data are not significantly affected by model deformation. B.W.

N82-25215*# Northrop Corp., Hawthorne, Calif. Aircraft Div.

WATER TUNNEL FLOW VISUALIZATION AND WIND TUNNEL DATA ANALYSIS OF THE F/A-18

Gary E. Erickson May 1982 268 p refs Original contains color illustrations 2 Vol.

(Contract NAS1-16617)

(NASA-CR-165859; NAS 1.26:165859) Avail: NTIS HC A12/MF A01 CSCL 01A

Six degree of freedom studies were utilized to extract a band of yawing and rolling moment coefficients from the F/A-18 aircraft flight records. These were compared with 0.06 scale model data obtained in a 16T wind tunnel facility. The results, indicate the flight test yawing moment data exhibit an improvement over the wind tunnel data to near neutral stability and a significant reduction in lateral stability (again to anear neutral level). These data are consistent with the flight test results since the motion was characterized by a relatively slo departure. Flight tests repeated the slow yaw departure at M 0.3. Only 0.16 scale model wind tunnel data showed levels of lateral stability similar to the flight test results. Accordingly, geometric modifications were investigated on the 0.16 scale model in the 30x60 foot wind tunnel to improve high angle of attack lateral stability. S.L.

N82-25216*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUBSONIC AERODYNAMIC AND FLUTTER CHARACTERISTICS OF SEVERAL WINGS CALCULATED BY THE SOUSSA P1.1 PANEL METHOD

E. Carson Yates, Jr., Herbert J. Cunningham, Robert N. Desmarais, Walter A. Silva, and Bohdan Drobenko May 1982 21 p refs Presented at the AIAA/ASME/ASCE/AHS 23rd Structures, Structural Dynamics and Materials Conf., New Orleans, 10-12 May 1982
(NASA-TM-84485; NAS 1.15:84485) Avail: NTIS HC A02/MF A01 CSCL 01A

The SOUSSA (steady, oscillatory, and unsteady subsonic and supersonic aerodynamics) program is the computational implementation of a general potential flow analysis (by the Green's function method) that can generate pressure distributions on complete aircraft having arbitrary shapes, motions and deformations. Some applications of the initial release version of this program to several wings in steady and oscillatory motion, including flutter are presented. The results are validated by comparisons with other calculations and experiments. Experiences in using the program as well as some recent improvements are described. S.L.

N82-25217*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EXPERIMENTAL DETERMINATION OF FLOW-INTERFERENCE EFFECTS OF WING-MOUNTED, TWO-DIMENSIONAL, FULL-CAPTURE PROPULSION NACELLES IN CLOSE PROXIMITY TO A VEHICLE BODY AT A MACH NUMBER OF 6

Walter A. Vahl May 1982 36 p refs
(NASA-TM-83287; L-15209; NAS 1.15:83287) Avail: NTIS HC A03/MF A01 CSCL 01A

Experimental tests have been conducted to determine possible aerodynamic interference effects due to the lateral positioning of two dimensional propulsion nacelles mounted on a wing surface in close proximity to a vehicle body. The tests were conducted at a Mach number of 6 and a Reynolds number 7 million per foot. The angle of attack range for force tests was -9 deg to 9 deg. The model configurations consisted of combinations of rectangular and trapezoidal cross section bodies with a wing swept 65 and a rectangular planform wing. A pair of two dimensional, flow through propulsion nacelles simulated full capture inlet operation. S.L.

N82-25218*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THRUST-INDUCED EFFECTS ON LOW-SPEED AERODYNAMICS OF FIGHTER AIRCRAFT

Daniel W. Banks, P. Frank Quinto, and John W. Paulson, Jr. May 1982 25 p refs
(NASA-TM-83277; NAS 1.15:83277) Avail: NTIS HC A02/MF A01 CSCL 01A

Results of NASA Langley has conducted wind-tunnel investigations of several fighter configurations conducted to determine the effects of both thrust vectoring and spanwise blowing are reviewed. A recent joint NASA/Grumman Aerospace Corporation/U.S. Air Force Wright Aeronautical Laboratory wind-tunnel investigation was conducted to examine the effects of spanwise blowing on the trailing-edge flap system. This application contrasts with the more familiar method of spanwise blowing near the wing leading edge. Another joint program among NASA/McDonnell Aircraft Company/U.S. Air Force Wright Aeronautical Laboratory investigated the effects of reverse thrust on the low-speed aerodynamics of an F-15 configuration. The F-15 model was fitted with a rotating van thrust reverser concept which could simulate both in-flight reversing for approach and landing or full reversing for ground roll reduction. The significant results of these two joint programs are reported. A.R.H.

N82-25219*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PRODUCTION VERSION OF THE EXTENDED NASA-LANGLEY VORTEX LATTICE FORTRAN COMPUTER PROGRAM. VOLUME 1: USER'S GUIDE

John E. Lamar and Harry E. Herbert Apr. 1982 178 p refs
(NASA-TM-83303; NAS 1.15:83303) Avail: NTIS HC A08/MF A01 CSCL 01A

The latest production version, MARK IV, of the NASA-Langley vortex lattice computer program is summarized. All viable subcritical aerodynamic features of previous versions were retained. This version extends the previously documented program capabilities to four planforms, 400 panels, and enables the user to obtain vortex-flow aerodynamics on cambered planforms, flowfield properties off the configuration in attached flow, and planform longitudinal load distributions. Author

N82-25220# Wisconsin Univ. - Madison. Mathematics Research Center.

NONLINEAR TWO-DIMENSIONAL SAIL THEORY

Jean-Marc Vanden-Broeck Oct. 1981 20 p refs
(Contract DAAG29-80-C-0041; Grant NSF MCS-79-27062)
(AD-A110450; MRC-TSR-2293) Avail: NTIS HC A02/MF A01 CSCL 01/3

Steady two-dimensional flow past a sail is considered. The sail is assumed to be supported by two masts. The flow and the shape of the sail are determined as functions of the direction alpha of the flow at infinity and the Weber number lambda. The full nonlinear problem is formulated as an integro-differential equation for the shape of the sail. This equation is discretized and solved numerically by Newton's method. Sail profiles, the slack in the sail, and the lift coefficient are presented for various values of alpha and lambda. GRA

N82-25221# Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.

ON THE AERODYNAMICS OF WINDBLAST Final Technical Report

Daniel J. Schneck 13 Nov. 1981 51 p refs
(Grant AF-AFOSR-3706-78)
(AD-A110495; VPI-E-81-31; AFOSR-82-0031TR) Avail: NTIS HC A04/MF A01 CSCL 20/4

In two previous reports (Schneck, 1976, 1979) a mathematical theory was developed in order to calculate the aerodynamic loading to which a pilot is exposed during high speed ejections. Neglecting the effects of flow separation, preliminary results suggested that the pilot's musculo-skeletal resistance is not likely to withstand the tendency for dislodgement from a restraining surface if he is ejecting at Mach numbers exceeding 0.72. Recently (Schneck, 1979) the mathematical theory of windblast was modified to include some effects of flow separation. In the report that follows, these effects are examined in greater detail, particularly as they affect the time-course of limb dislodging forces after the onset of windblast. GRA

N82-25223# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

EXPERIMENTAL ANALYSIS OF THE EFFECTS OF SWEEP AND ASPECT RATIO ON INCOMPRESSIBLE FLOW ABOUT FORWARD SWEPT WINGS M.S. Thesis

Paul W. Savage Dec. 1981 142 p refs
(AD-A111128; AFIT/GAE/AA/81D-26) Avail: NTIS HC A07/MF A01 CSCL 01/3

Low speed wind tunnel tests were conducted on nine wing planforms to determine the effect of sweep and aspect ratio on forward swept wings in incompressible flow. Sweep angles tested were -15, -30 and -45 degrees. Aspect ratios ranged from 2.05 to 4.79. A NACA 0006 airfoil section perpendicular to the leading edge was used for all models. Results showed increasing negative sweep decreased lift curve slope and shifted the aerodynamic center rearward. Increasing aspect ratio increased lift curve slope, decreased drag coefficient and shifted the aerodynamic center rearward. The wind tunnel aerodynamic data were compared to the Air Force Flight Dynamics Laboratory's Large Aircraft Performance Prediction Program to determine the program's ability to predict forward swept wing aerodynamic coefficients. At incompressible Mach numbers, the program was found to be accurate in predicting lift curve slope in the linear range using a positive sweep input. Drag Polar slope and moment coefficient were accurately predicted for lift coefficients below 0.4 using a negative sweep angle input. Neither positive nor negative angle input predicted maximum lift coefficient accurately. Author (GRA)

N82-25225# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

AIRBORNE/SPACEBORNE COMPUTERS
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AIRCRAFT BRAKES
Tire tread temperatures during antiskid braking and cornering on a dry runway [NASA-TP-2009] N82-24193

AIRCRAFT CARRIERS
Aircraft carrier - Surface effect ship [AIAA PAPER 82-0808] A82-31981

AIRCRAFT COMMUNICATION
Radiating elements for hemispherically scanned arrays --- onboard aircraft for data links to satellites A82-32992
Aviation electronics /4th edition/ --- Book A82-33646

AIRCRAFT CONFIGURATIONS
Multibody transport concept [AIAA PAPER 82-0810] A82-31983
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Aerodynamics. Part 2 - Methods of aerodynamic design /3rd revised and enlarged edition/ --- Russian book A82-33387
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Flow visualization techniques for the study of high incidence aerodynamics [ONERA, TP NO. 1982-5] A82-34493
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System study of application of composite materials for future transport aircraft [AIAA PAPER 82-0812] A82-31985
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Roll response criteria for transport aircraft with advanced flight control systems in the landing approach and touchdown [NLR-TR-80103-U] N82-25265
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AIRCRAFT DESIGN
The potential of large aircraft [AIAA PAPER 82-0809] A82-31980
Multibody transport concept [AIAA PAPER 82-0810] A82-31983
Solar-powered airplane design for long-endurance, high-altitude flight [AIAA PAPER 82-0811] A82-31984
Very large aircraft with alternate fuels - LH2 most promising [AIAA PAPER 82-0813] A82-31986
The potential for long-range high-payload aircraft with alternate fuels [AIAA PAPER 82-0814] A82-31987
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A82-33387
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AIRCRAFT DETECTION
A multifrequency adaptive radar for detection and identification of objects - Results on preliminary experiments on aircraft against a sea-clutter background
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An experimental investigation of interfacial temperatures in blade-seal material rubbing of aircraft compressors
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Analysis of transient data from aircraft gas turbine engines using AIDS
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[NASA-FACTS-93/8-81] N82-25251
Cost/benefit studies of advanced materials technologies for future aircraft turbine engines: Materials for advanced turbine engines
[NASA-CR-167849] N82-25254

AIRCRAFT EQUIPMENT
Aviation electronics /4th edition/ --- Book
A82-33646
High technology raises fighter force readiness
A82-33892
Aircraft potential variations in flight
[ONERA, TP NO. 1982-11] A82-34499
A new all-purpose digital flight data recorder
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AIRCRAFT FUELS
The potential of large aircraft
[AIAA PAPER 82-0804] A82-31980
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[AIAA PAPER 82-0813] A82-31986
The potential for long-range high-payload aircraft with alternate fuels
[AIAA PAPER 82-0814] A82-31987
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[AD-A1110[illegible]] N82-24355
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[NASA-CR-165367] N82-25635

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Considerations for international joint venture development of very large aircraft
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Beyond 2000 - The airlift challenge ahead
[AIAA PAPER 82-0815] A82-31988
The beginning of the ATR 42 program and its importance
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Military aircraft and international policy
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The Airbus family of aircraft at the dawn of the 1980's
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V/STOL tilt rotor research aircraft. Volume 3: Ship 2 instrumentation
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V/STOL tilt rotor research aircraft. Volume 4: CPE technical data
[NASA-CR-166350] N82-24197
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  The Royal Aircraft Establishment: 100 years of research
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  Research and development at MBB. Technical and scientific publications, 1981
  N82-23137
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  [AIAA 82-0735] A82-30182
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  [NASA-TM-83302] N82-23549
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  [NASA-TP-1986] N82-23284
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  [DFVLR-MITT-82-01] N82-23560
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  Review of rotorcraft accidents 1977-1979
  [PB82-115601] N82-22237
  New development in flying qualities with application to rotary wing aircraft
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  Past applications and future potential of variable stability research helicopters
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  Applications of system identification methods to the prediction of helicopter stability, control and handling characteristics
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  NASA/NAA Advanced Rotorcraft Technology and Tilt Rotor Workshop. Volume 6: Vehicle Configuration Session
  [NASA-TM-84180] N82-23282

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Component coupling with time-invariant mass matrix for nonisotropic rotating and nonrotating systems
[AIAA 82-0727] A82-30178
La Recherche Aerospatiale, bi-monthly bulletin number 1981-5, September - October 1981 --- Aerospace E and P Methodology and Instrumentation
[ESA-TT-725] N82-22145
Helicopter rotor performance improvement by utilization of swept-back parabolic blade tip --- wind tunnel tests
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Performance testing of a main rotor system for a utility helicopter at 1/4 scale
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A flight investigation of blade-section aerodynamics for a helicopter main rotor having RC-SC2 airfoil sections
[NASA-TM-83298] N82-22143
Unified results of several analytical and experimental studies of helicopter handling qualities in visual terrain flight
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NASA/FAA Advanced Rotorcraft Technology and Tilt Rotor Workshop. Volume 6: Vehicle Configuration Session
[NASA-TM-84190] N82-22242
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[FOA-C-30243-E1] N82-22600
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Investigation of passive shock wave-boundary layer control for transonic airfoil drag reduction
[NASA-CR-168868] N82-22000
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STOL aircraft structural vibration prediction from acoustic excitation
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Parametric study of the influence of the engine upon the operating cost of a civil helicopter
[SNIAS-827-210-102] N82-22273

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Comparison of reliability, sensitivity and accuracy of some NDI-Techniques
[NLR-MP-80039-U] N82-23542

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Review of aeronautical fatigue investigations in the Netherlands, March 1979 - February 1981
[NLR-MP-81006-U] N82-22153

DERIJK, R.
Comparison of reliability, sensitivity and accuracy of some NDI-Techniques
[NLR-MP-80039-U] N82-23542

DESMARAIS, R. N.
Subsonic aerodynamic and flutter characteristics of several wings calculated by the SOUSSA P1.1 panel method
[AIAA PAPER 82-0727] A82-30193
An accurate method for evaluating the kernel of the integral equation relating lift to downwash in unsteady potential flow
[NASA-TM-83281] N82-23194

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[AIAA 82-0711] A82-30125

DOBRZYNSKI, W.
Ground reflection effects in measuring propeller aircraft flyover noise
[DFVLR-FB-81-28] N82-22990

DOGGETT, R. V., JR.
Evaluation of four subcritical response methods for on-line prediction of flutter onset in wind-tunnel tests
[AIAA 82-0644] A82-30140
Evaluation of four subcritical response methods for on-line prediction flutter onset in wind-tunnel tests
[NASA-TM-83278] N82-23240

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AERONAUTICAL ENGINEERING

A CONTINUING BIBLIOGRAPHY
WITH INDEXES

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is independent of exciting frequency. The eigenfrequencies located in a given small interval and their proper damping values and eigenvibrational modes are determined. Finally, potential generalizations from the procedure are applied to several variant cases. C.D.

A82-32137 **Transformation relations for singularity avoidance in three-dimensional trajectory optimization (Transformationsbeziehungen bei der Optimierung dreidimensionaler Flugbahnen zur Umgehung von Singularitäten).** G.-C. Shau (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Dynamik der Flugsysteme, Obepfaffenhofen, West Germany). *Zeitschrift für Flugwissenschaften und Weltraumforschung,* vol. 6, Mar.-Apr. 1982, p. 90-98. 6 refs. In German.

Problems in calculating the line of flight of an aircraft can be solved by referring the flight motion to a geodetic set of axes, translating the speed and power to that set. The equations of motion can then be written according to Newton's laws, and the right sides of these equations and their adjoint differential equations are regularly differentiable. Based on the Hamilton-Jacob theory, a procedure for translating adjoint variables to geodetic coordinates with the help of given variables in aerodynamical coordinates, and vice-versa, is developed. This will make it possible to switch the system of equations to each iteration state without losing the intermediate results. A concrete example of flight condition at 90 degrees is analyzed. C.D.

A82-32159 **Hydrogen economy assessment for long-term energy systems in Japan.** T. Ohtsuka (Tohoku University, Sendai, Japan), M. Akiyama, T. Saito, Y. Ishizaki, A. Suzuki (Tokyo, University, Tokyo, Japan), N. Negishi, J. Moriya, K. Hoashi, and T. Hoshino (Industrial Research Institute, Tokyo, Japan). *International Journal of Hydrogen Energy,* vol. 7, no. 6, 1982, p. 455-462.

An assessment is made of hydrogen technology development; in particular, economy as an energy carrier, applicability for end-uses and the potential of the market in the future. Specifically, rough static cost comparisons are made on several modes of electricity transmission and hydrogen transport, and on several ways of off-peak electricity saving; including energy storage in the form of hydrogen. Then, the quantity of oil that could be saved from some representative end-use sectors if hydrogen fuel were to be introduced is discussed. Finally, a potential market is assessed, by projecting overall future energy supply/demand dynamics in Japan. (Author)

A82-32202 **Shock associated noise of supersonic jets from convergent-divergent nozzles.** C. K. W. Tam (Lockheed-Georgia Co., Marietta, GA; Florida State University, Tallahassee, FL) and H. K. Tanna (Lockheed-Georgia Co., Marietta, GA). *Journal of Sound and Vibration,* vol. 81, Apr. 8, 1982, p. 337-358. 26 refs. Research supported by the Lockheed Internal Research and Development Funds.

Experimental and theoretical results are presented on the characteristics of shock-associated noise from imperfectly expanded supersonic jets from convergent-divergent nozzles over an extensive range of underexpanded and overexpanded operating conditions. The source of this noise is believed to be the weak but coherent interaction between the downstream-propagating large-scale turbulent flow structures in the mixing layer of the jet and the nearly periodic shock cell system. Reasoning based on this mechanism leads to the scaling formula that the intensity of shock-associated noise varies as (Mj-squared minus Md-squared)-squared, where Mj and Md are the fully expanded jet operating Mach number and the nozzle design Mach number, respectively. A peak frequency formula is also derived from the same model. The noise intensity, directivity, and spectra of supersonic jets from a convergent-divergent nozzle of design Mach number 1.67 were measured in an anechoic chamber over the Mach number range of 1.1 to 2.0. Theoretical results agree very favorably with measurements. B.J.

A82-32223 **Analysis of small-aspect-ratio lifting surfaces in ground effect.** J. N. Newman (MIT, Cambridge, MA). *Journal of Fluid Mechanics,* vol. 117, Apr. 1982, p. 305-314. 5 refs. Research supported by the Australian Research Grants Committee, U.S. Navy, and NSF.

A lifting surface of small aspect ratio is analysed for motion with constant forward velocity, parallel and in close proximity to a rigid plane surface of infinite extent. The gap flow beneath the lifting surface is represented by a simple nonlinear solution in the cross-flow plane, and appropriate conditions are imposed at leading and trailing edges. The transition between these two conditions depends on the kinematics of the gap flow as well as the planform geometry. For steady-state motion of a delta wing with sufficiently large angle of attack, the transition point is upstream of the tail. For oscillatory heaving motion of a delta wing the transition point is cyclic if the heave velocity is sufficiently large. Illustrative computations of the lift force are presented. (Author)

A82-32330 * **Experimental investigation of turbulent wall-jets in the presence of adverse pressure gradients in a rectangular diffuser.** L. Back and R. Cuffel (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). *International Journal of Heat and Mass Transfer,* vol. 25, June 1982, p. 871-887. 7 refs. Contracts No. N00019-76-MP-67811; No. NAS7-100.

An experimental study of wall static pressure distributions and mean velocity profiles along a duct and diffuser downstream of wall-jet injection was conducted over a range of diffuser total angles from 15 to 40 deg at injection to core flow mass flux ratios from 0 to 6. Pressure recovery in the diffuser increased with injection ratio and decreased with diffuser total angle. Peak velocities in the wall-jet decayed along the flow and the inner shear layer and outer mixing region grew in thickness along the flow. The inner layer was near similarity condition, but non-similar variations were found in the outer layer. Estimated wall shear stresses depended upon injection mass fluxes, downstream distance and diffuser total angle. Greater decay of peak velocity and larger friction coefficients were found in the diffuser than indicated by correlations from data for a wall-jet without a pressure gradient. At the largest diffuser total angle and the highest injection ratio flow reversal occurred in the core region. (Author)

A82-32624 **British aerospace begins update effort.** *Aviation Week and Space Technology,* vol. 116, May 17, 1982, p. 78, 83, 85, 86, 89.

Among the advanced production technologies selected for installation by British Aerospace Corporation's Aircraft Group are: semi-automated carbon fiber production, super plastic forming/diffusion bonding (SPF-DB) of bond titanium and aluminum alloys, and introduction of direct numerical control of manufacturing processes and a CAD/CAM program. Development programs for these technologies are discussed, including a water jet carbon fiber cutting machine, a carbon fiber second fuselage that is easier to assemble, a new forming press for SPF-DB components, a pilot program for SPF-DB production which includes a 500-ton forming press, and numerically controlled robots and machine tools. C.D.

A82-32725 **Nondestructive detection of exfoliation corrosion around fastener holes in aluminum wing skins.** D. J. Hagemaier (Douglas Aircraft Co., Long Beach, CA). *Materials Evaluation,* vol. 40, May 1982, p. 682-685.

Instructions are given for nondestructive inspections performed on the upper and lower wing skin surfaces for the presence of corrosion around fastener holes. Three methods of inspection are involved: contact ultrasonic testing, contact eddy current testing, and automated ultrasonic C-scan testing. Descriptions are given of these methods. With the contact ultrasonic test, corrosion is detected by the loss of a back surface signal. With the contact eddy current test, the phase-sensitive, eddy current instrument is calibrated to yield a maximum response difference between a corroded and uncorroded area. With the ultrasonic C-scan recording test, a flaw gate is set to record a loss of 50% signal amplitude of the back-surface signal. Here, uncorroded areas of the part are recorded, whereas corroded areas do not record. C.R.

A82-32801 † **Mathematical modeling of unsteady separated flow past solid airfoil cascades (Matematicheskoe modelirovanie nestatsionarnogo otryvnogo obtekaniia reshetok telesnykh profilei).** V. N. Kotovskii, M. I. Nisht, and R. M. Fedorov. *Akademiia Nauk SSSR, Doklady,* vol. 263, no. 6, 1982, p. 1326-1330. 7 refs. In Russian.

Unsteady separated flow past solid airfoil cascades is investigated using a complex approach which combines an ideal medium scheme for a finite-thickness body in the case of the main part of the flow with boundary-layer theory in the case of the region directly adjacent to the body surface. With this approach, phenomena as complex as hysteresis in separated flow past solid bodies can be successfully simulated using a computer. It is found that as the dimensionless frequency increases, the hysteresis of the separation point decreases and the hysteresis of the normal profile force coefficient, Cn, increases. It is also shown that hysteresis, in the separation point position and in Cn increases and the hysteresis loop shifts toward the leading edge with decreasing cascade density and increasing mean angle of attack. V.L.

A82-32847 * # **Wind-tunnel wall interference corrections for three-dimensional flows.** M. H. Rizk and M. G. Smithmeyer (Flow Research Co., Kent, WA). *Journal of Aircraft,* vol. 19, June 1982, p. 465-472. 11 refs.

A procedure for the evaluation of wall interference corrections for three-dimensional aircraft configurations is presented. The Mach number and angle-of-attack corrections are obtained by numerically solving the Laplace equation in a parallelepiped with boundary conditions supplied mainly from experimental pressure measurements. A portion of these measurements and other wind-tunnel data required by the procedure may be replaced by theoretical estimates if not available from experiments. The accuracy of the correction results will then depend on the accuracy of these estimates. The correction procedure is applied to an isolated wing and to a wing-tail configuration in a solid-wall wind tunnel. It is found that neglecting twist and camber corrections for the wing effectively increases the tail angle-of-attack correction. Two different Mach number corrections can be calculated for the wing and tail. However, since only one Mach number correction is allowed for both the wing and the tail, and since the wing surface area is larger than the tail surface area, the final correction tends to be closer to the required wing correction. This is a source of error for the tail results. (Author)

A82-32848 # **Finite-element modeling of a fighter aircraft canopy acrylic panel.** J. J. Labra (Southwest Research Institute, San Antonio, TX). *Journal of Aircraft,* vol. 19, June 1982, p. 480-484.

A detailed three-dimensional stress analysis of a canopy aircraft acrylic panel was conducted to investigate the probable cause of a recent in-flight acrylic panel failure. The analysis was made using a general-purpose finite-element computer program. Based in part on this analysis, probable design problems associated with the canopy were identified. The study clearly demonstrates that computer-based technology can be successfully used in determining probable causes of failure in geometrically complex structures. (Author)

A82-32849 # **Structural modification to achieve antiresonance in helicopters.** B. P. Wang, L. Kitis, W. D. Pilkey, and A. Palazzolo (Virginia, University, Charlottesville, VA). *Journal of Aircraft,* vol. 19, June 1982, p. 499-504. 12 refs. Army-supported research.

A design method is developed to create an antiresonance (by modifying structural properties) of a vibrating system under sinusoidal loading. A local modification method in which appendant systems are added to the original structure is used to analyze such systems. Since the original system and added systems are treated entirely separately, this method allows for efficient repetitive searching until the appendant system produces a meaningful reduction in vibration. Finally, the direct design of appendant structures to create antiresonance is presented. These methods are illustrated by numerical results obtained for a 44-degree-of-freedom elastic line helicopter model. (Author)

A82-32850 # **Incompressible symmetric flow characteristics of sharp-edged rectangular wings.** E. S. Larson (Flygtekniska Forsoksanstalten, Stockholm, Sweden). *Journal of Aircraft,* vol. 19, June 1982, p. 508-510. 8 refs. Research supported by the Forsvarets Materielverk.

In a previous study (Larson, 1981), the symmetric aerodynamic characteristics of sharp-edged rectangular wings were obtained by a set of semiempirical analytical formulas that represent Lamar's (1974) extension of the Multhopp solution. A difference between theory and experiment has been noticed, however, in regard to the lift and pitching moment coefficients for all the investigated aspect ratios except A = 1. The present study examines whether this discrepancy is a result of the formulation of the angle of attack squared in combination with the side-edge suction force coefficient. Improved correlation with experiments in incompressible flow up to moderately high angles of attack is obtained by using an alpha to the 5/3 dependence of the side-edge singularity of sharp-edged rectangular wings. C.D.

A82-32920 * # **Cloud top remote sensing by airborne lidar.** J. D. Spinhirne, M. Z. Hansen, and L. O. Caudill (NASA, Goddard Space Flight Center, Greenbelt, MD). *Applied Optics,* vol. 21, May 1, 1982, p. 1564-1571. 10 refs. NASA-supported research.

Observations of cloud top height, backscattering, and signal depolarization have been obtained by a lidar system operating onboard a high-altitude research aircraft. The transmitter for the cloud lidar system is a doubled Nd:YAG laser operating at 5 Hz. The system functions as a fully automated sensor under microprocessor control and operates from a nominal 19-km altitude. Measurements have been acquired over a wide variety of cloud cover in conjunction with passive visible and infrared measurements. Initial observation results are reported. (Author)

A82-32979 **A multifrequency adaptive radar for detection and identification of objects - Results on preliminary experiments on aircraft against a sea-clutter background.** D. T. Gjessing, J. Hjelmstad, and T. Lund (Norges Teknisk-Naturvitenskapelige Forskningsrad, Kjeller, Norway). *IEEE Transactions on Antennas and Propagation,* vol. AP-30, May 1982, p. 351-365. 16 refs.

An experimental model of a simple multifrequency continuous wave (CW) radar system has been developed. Preliminary experiments have been performed in order to illustrate the potential of this radar concept in regard to detection, course ranging, and also identification of low flying aircraft against a sea-clutter background. The radar can be organized so as to measure ocean wave height, wave direction, and wave velocity simultaneously for 15 different ocean wavelengths ranging from 150 m to approximately 6 m. An example of such a directional wave intensity spectrum is given. To illustrate the ranging and the identification potential of the technique in regard to airplanes, two different airplane categories, namely a propeller aircraft (Cessna 172) and a grid jet aircraft (F-16), were flown through the radar beam. The signatures of these two airplanes are shown in two signature domains: spatial distribution of scattering centers and motion pattern. The experimental results confirm theories presented in earlier contributions. It remains to introduce two more domains, namely the space/time coherence properties of the target and its polarization characteristics. (Author)

A82-32992 **Radiating elements for hemispherically scanned arrays.** A. T. Villeneuve (Hughes Aircraft Co., Los Angeles, CA), M. C. Behnke, and W. H. Kummer. *IEEE Transactions on Antennas and Propagation,* vol. AP-30, May 1982, p. 457-462. Contract No. F19268-72-C-0145.

Several types of radiating elements, including single slots covered by dielectric sheets, parasitic dipoles, and surface wave structures, have been investigated with reference to their wide angle scanning capabilities for application in hemispherically scanned arrays. It is shown that by using a combination of a surface wave structure and a parasitic radiator, it is possible to enhance E-plane radiation at the horizon and to broaden the H-plane pattern of a slot radiator in conducting planes and cylinders. The surface wave structure was also used with an eight-element array of slots oriented perpendicular to the array axis. This arrangement enhanced the radiation for a beam at the horizon (endfire) by several dB over that obtained from an array without the surface wave structure. V.L.

A82-33025 # **The aerospace learning process.** W. M. Hawkins (Lockheed Corp., Burbank, CA). *American Institute of Aeronautics and Astronautics, International Annual Meeting and Technical Display, Baltimore, MD, May 25-27, 1982, Paper 82-1291.* 6 p.

A number of projects significant in the history of aerospace are reviewed and lessons to be learned are stated. The role of private industry and government in the design and production of the Hudson, the P-38, the F-80, the C-130, the Discoverer, the Polaris, and the Reentry Test Vehicle are discussed. It is contended that high quality can be achieved with significant savings of time and money

STAR ENTRIES

N82-24163# Naval Postgraduate School, Monterey, Calif.
CANNIBALIZATION OF THE F-14 AND S-3A AIRCRAFT: A VIABLE LOGISTIC M.S. Thesis
Kevin M. Myette Mar. 1981 112 p refs
(AD-A111207) Avail: NTIS HC A06/MF A01 CSCL 05/1

This thesis presents the results of an analysis of cannibalization and its effects on the F-14A and S-3A aircraft. The analysis includes cannibalization measurement methodologies, reasons why squadrons cannibalize, a comparison of fleet cannibalization activity and alternatives to cannibalization. Cannibalization is shown not to be a maintenance practice to be avoided at all cost, but rather a viable cost effective alternative to logistic failures. Additionally, material issue response delays rather than material shortages were found to lead to increased cannibalization. Author (GRA)

N82-24164# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Direction Etudes.
THE AIRBUS FAMILY OF AIRCRAFT AT THE DAWN OF THE 1980'S [LA FAMILLE 'AIRBUS' A L'AUBE DES ANNEES 1980]
G. Brohannis 7 Jan. 1982 9 p In FRENCH Submitted for publication
(SNIAS-821-111-101) Avail: NTIS HC A02/MF A01

The development and marketing of the European Airbus are reviewed. General characteristics of the A-300 B4, already in service, are presented, including flight performance and operational costs. Industrial spin-offs from the project and the impetus to European competitiveness in the field of civil aviation are mentioned. Among ongoing developments and future projects the A-310 aircraft and A-300-600 aircraft are cited. Author (ESA)

N82-24165*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL AND ANALYTICAL RESULTS OF TANGENTIAL BLOWING APPLIED TO A SUBSONIC V/STOL INLET
Richard R. Burley and Danny P. Hwang 1982 18 p refs Proposed for presentation at the 18th Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; sponsored by AIAA, SAE and ASME
(NASA-TM-82847; E-1217; NAS 1.15:82847) Avail: NTIS HC A02/MF A01 CSCL 01A

Engine inlets for subsonic V/STOL aircraft must operate over a wide range of conditions without internal flow separation. Experimental and analytical investigations were conducted to evaluate the effectiveness of tangential blowing to maintain attached flow to high angles of attack. The inlet had a relatively thin lip with a blowing slot located either on the lip or in the diffuser. The height and width of these slots was varied. Experimentally determined flow separation boundaries showed that lip blowing achieved higher angle of attack capability than diffuser blowing. This capability was achieved with the largest slot circumferential extent and either of the two slot heights. Predicted (analytical) separation boundaries showed good agreement except at the highest angles of attack. S.L.

N82-24166*# Ohio State Univ., Columbus. Dept. of Aeronautical and Astronautical Engineering.
RIME ICE ACCRETION AND ITS EFFECT ON AIRFOIL PERFORMANCE Ph.D. Thesis. Final Report
Michael B. Bragg Mar. 1982 182 p refs
(Grant NAG3-28)
(NASA-CR-165599; NAS 1.26:165599) Avail: NTIS HC A09/MF A01 CSCL 01A

A methodology was developed to predict the growth of rime ice, and the resulting aerodynamic penalty on unprotected, subcritical, airfoil surfaces. The system of equations governing the trajectory of a water droplet in the airfoil flowfield is developed and a numerical solution is obtained to predict the mass flux of super cooled water droplets freezing on impact. A rime ice shape is predicted. The effect of time on the ice growth is modeled by a time-stepping procedure where the flowfield and droplet mass flux are updated periodically through the ice accretion process. Two similarity parameters, the trajectory similarity parameter and accumulation parameter, are found to govern the accretion of rime ice. In addition, an analytical solution is presented for Langmuir's classical modified inertia parameter. The aerodynamic evaluation of the effect of the ice accretion on airfoil performance is determined using an existing airfoil analysis code with empirical corrections. The change in maximum lift coefficient is found from an analysis of the new iced airfoil shape. The drag correction needed due to the severe surface roughness is formulated from existing iced airfoil and rough airfoil data. A small scale wind tunnel test was conducted to determine the change in airfoil performance due to a simulated rime ice shape. Author

N82-24167*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THREE-DIMENSIONAL SEPARATION AND REATTACHMENT
David J. Peake and Murray Tobak Mar. 1982 17 p refs
(NASA-TM-84221; A-8845; NAS 1.15:84221) Avail: NTIS HC A02/MF A01 CSCL 01A

The separation of three dimensional turbulent boundary layers from the lee of flight vehicles at high angles of attack is investigated. The separation results in dominant, large scale, coiled vortex motions that pass along the body in the general direction of the free stream. In all cases of three dimensional flow separation and reattachment, the assumption of continuous vector fields of skin friction lines and external flow streamlines, coupled with simple laws of topology, provides a flow grammar whose elemental constituents are the singular points: the nodes, spiral nodes (foci), and saddles. The phenomenon of three dimensional separation may be construed as either a local or a global event, depending on whether the skin friction line that becomes a line of separation originates at a node or a saddle point. S.W.

N82-24168*# Bihrle Applied Research, Inc., Jericho, N. Y.
F-15 ROTARY BALANCE DATA FOR AN ANGLE-OF-ATTACK RANGE OF 8 DEG TO 90 DEG Final Report
Billy Barnhart Washington NASA May 1982 378 p refs 2 Vol.
(Contract NAS1-16205)
(NASA-CR-3478; NAS 1.26:3478) Avail: NTIS HC A17/MF A01 CSCL 01A

Aerodynamic characteristics obtained in a rotational flow environment, utilizing a rotary balance are presented in plotted form for a 1/12 scale F-15 airplane model. The configurations tested included the buildup of airplane components and the basic airplane with various control deflections. Data are presented for all configurations without analysis for an angle of attack range of 8 to 90 deg. and clockwise and counterclockwise rotations covering an omega b/2V range from 0 to 0.4. Selected configurations are presented over an extended omega b/2V range from 0 to 0.9. S.L.

N82-24169*# Bihrle Applied Research, Inc., Jericho, N. Y.
ROTARY BALANCE DATA FOR AN F-15 MODEL WITH CONFORMAL FUEL TANKS FOR AN ANGLE-OF-ATTACK RANGE OF 8 DEG TO 90 DEG Final Report
Billy Barnhart Washington NASA May 1982 377 p refs 2 Vol.
(Contract NAS1-16205)
(NASA-CR-3516; NAS 1.26:3516) Avail: NTIS HC A17/MF A01 CSCL 01A

Aerodynamic characteristics obtained in a rotational flow environment, utilizing a rotary balance, are presented in plotted form for a 1/12 scale conformal fuel tank equipped F-15 airplane model. The configurations tested included in the buildup of airplane components and the basic airplane with various control deflections. Data are presented for all configurations without analysis for an angle of attack range of 8 to 90 deg. and clockwise and counterclockwise rotations covering an omega b/2V range from 0 to 0.4. Selected configurations are presented over an extended omega b/2V range from 0 to 0.9. S.L.

INVESTIGATION OF UPWIND SCHEMES FOR FINITE ELEMENT ANALYSIS OF TRANSONIC FLOW OVER THIN AIRFOILS M.S. Thesis
Dennis L Hunt Dec 1981 93 p refs
(AD-A111168. AFIT/GAE/AA/81D-15) Avail NTIS HC A05/MF A01 CSCL 20/4

Two finite element upwind techniques were investigated to see if convergent solutions could be obtained from the transonic potential equation for steady flow over thin airfoils. The first technique involves the use of parabolic upwind functions, that when added to the shape functions weight the upstream node in the supersonic region more than the downwind nodes. The second technique integrates the finite element equations over the area that influences the solution (i.e., the area inside a mach cone) Author (GRA)

N82-25228# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
STARTING TRANSIENTS IN SUPERSONIC NOZZLES AND NOZZLE-DIFFUSER ASSEMBLIES M.S. Thesis
Thomas Gregory Gates Dec. 1981 47 p refs
(AD-A111143. AFIT/GA/AA/81D-6) Avail NTIS HC A03/MF A01 CSCL 20/4

In this investigation, the flow processes involved in shock induced starting of nozzles and diffusers similar to those used in gasdynamic lasers were studied. Two geometrically similar nozzles were used. The throat opening in the large single nozzle was 0.276 inches. The other was an array of nine nozzle passages in which the throat opening was 0.069 inches. Downstream of the nine nozzles were nine diffusers whose minimum opening was 0.286 inches. These 2-dimensional nozzles and diffusers were 0.75 inches thick. A fully started condition of uniform supersonic flow was achieved throughout the entire test area for both test sections. The processes leading to this condition were highly dynamic and complicated. It was found that successful starting depended not only on the initial diaphragm pressure ratio, but also the downstream test cell configuration. Starting the large single nozzle was enhanced by an increase of flow channel just downstream from the nozzle. This decreased the strength of the incident shock wave and there by increased the pressure ratio applied across the nozzle. As a result, the gasdynamic starting shock could pass on out of the nozzle at lower shock tube diaphragm pressure ratios than would have been the case if the area had remained constant in the flow channel behind the nozzle. GRA

N82-25230# Aeronautical Research Inst. of Sweden, Stockholm. Aerodynamics Dept.
THE FFA WING BODY 81 COMPUTER PROGRAM. A PANEL METHOD FOR DETERMINATION OF AERODYNAMIC CHARACTERISTICS AT SUBSONIC AND SUPERSONIC SPEEDS
Sven G. Hedman and Lars G. Tysell 1982 36 p refs
(Contract FMV-F-INK-82223-78-170-21-001)
(FFA-TN-AU-1601) Avail NTIS HC A03/MF A01

A panel program is extended in order to account for unsymmetric configurations and flow fields symmetric, antisymmetric or unsymmetric to the vertical plane. Input instructions are given. The program calculates pressure distribution for completely specified geometries, wing camber for given load distributions, and wing camber for minimum drag with given values of lift and pitching moment. The body length is divided into intervals each with a distribution of sources or doublets of either constant or linearly varying intensity. The boundary condition is fulfilled on the body surface midway between the ends of an interval. Compressible velocities are obtained by the Goethert rule and alternatively for the wing by a semiempirical compressibility correction method, based on the nonlinear compressibility effects in the flow about two-dimensional and sheared wings. Comparison of results with known data shows that the program works best for subsonic load calculations, involving elastic airplanes.
Author (ESA)

N82-25231# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.
MODIFIED VERSION OF LTRAN2: A CALCULATION METHOD FOR INVISCID TRANSONIC FLOW ABOUT THIN AIRFOILS IN MODERATELY SLOW UNSTEADY MOTION
J. vanderVooren and G. H. Huizing 26 Jun. 1980 54 p refs
(Contract NIVR-1814)
(NLR-TR-80059-U) Avail NTIS HC A04/MF A01

A method for strictly slow unsteady motions is modified by including extra unsteady terms in the boundary conditions. The unsteady transonic small perturbation equation and the airfoil, wake and far field boundary conditions are derived heuristically. A radiation condition on the far field boundary which accommodates outgoing disturbances only is presented. Analysis shows that the infinite physical domain surrounding the airfoil can not be mapped onto a finite computational domain. Numerical experiments on an airfoil oscillating in pitch at reduced frequencies 0.05 and 0.1 for a freestream Mach number = 0.85, and zero angle of attack show that radiation condition can reduce the computational domain and the number of grid points.
Author (ESA)

N82-25232# National Aerospace Lab., Amsterdam (Netherlands). Informations Div.
COMPARISON OF BOUNDARY LAYER CALCULATIONS FOR THE ROOT SECTION OF A WING. THE SEPTEMBER 1979 AMSTERDAM WORKSHOP TEST CASE
J. P. F. Lindhout, B. vandenBerg, and A. Elsenaar 6 Mar. 1981 71 p refs
(NLR-MP-80028-U) Avail NTIS HC A04/MF A01

Integral and field method calculations of three-dimensional turbulent boundary layer development, including separation, on the root section of a swept wing are compared. Although the predicted position of the separation region varies, all methods give a good global impression of the state of the nonseparated part of the three-dimensional boundary layer. In the weakly three-dimensional region of the flow, agreement between the results is very good. In the strongly three-dimensional region, variation is considerable. Field methods vary more than integral methods. The integral methods are on average ten times faster than the field methods. Author (ESA)

N82-25233# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Drehfluegler.
THE PROBLEM OF CALCULATION OF THE FLOW AROUND HELICOPTER ROTOR BLADE TIPS
H. Stahl 19 Aug. 1981 22 p refs Presented at 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DGLR
(MBB-UD-330-81-O) Avail NTIS HC A02/MF A01

Computational problems that arise with the theoretical analysis of the flow around rotary wing blade tips are evoked. The modification of existing computer programs in order to handle three-dimensional, unsteady, rotational flow that, on the advancing blade in fast forward flight, can also be transonic is discussed. Potential flow theory is presented. A program for steady three-dimensional flow past a fixed wing was adapted for a rotating blade, taking into account the irrotational condition of the applied theory. Calculations show that this approach leads to an acceptable description of the actual flow Author (ESA)

N82-25234# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Drehfluegler und Verkehr.
PROGRAM PRESENTATION OF THE WORKING GROUP SEPARATED FLOW: PROBLEMS WITH ROTARY WINGS [PROGRAM-PRAESENTATION DER ARBEITSGEMEINSCHAFT STROEMUNGEN MIT ABLOESUNGEN (STAB): THEMENKREIS DREHFLUEGEL]
G. Polz 19 Mar. 1981 19 p In GERMAN
(MBB-UD-336-81-O) Avail NTIS HC A02/MF A01

With reference to propellers and rotors, relevant separation phenomena and their resulting effects are described. These include stress induced separation at the blade tip associated with high Mach numbers, separation due to exceeding maximum lift for low Mach numbers, and vortex induced separation. Cause/effect relationships with advancing blade tip vortices are emphasized. All of these separation phenomena have a negative influence on performance and economy in flight management. As for helicopter rotors, the identified extremely high dynamic flight loads can cause acute structural loading and vibration. Minimization of flow separation and its effects is possible by improving blade profiles, optimizing blade shapes (planform/warpage), and by developing blade tips. Author (ESA)

N82-25235*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EVALUATION OF A VOICE RECOGNITION SYSTEM FOR

THE MOTAS PSEUDO PILOT STATION FUNCTION
Jacob A. Houck Apr. 1982 57 p refs
(NASA-TM-84487; NAS 1.15:84487) Avail: NTIS HC A04/MF A01 CSCL 17G

The Langley Research Center has undertaken a technology development activity to provide a capability, the mission oriented terminal area simulation (MOTAS), wherein terminal area and aircraft systems studies can be performed. An experiment was conducted to evaluate state-of-the-art voice recognition technology and specifically, the Threshold 600 voice recognition system to serve as an aircraft control input device for the MOTAS pseudo pilot station function. The results of the experiment using ten subjects showed a recognition error of 3.67 percent for a 48-word vocabulary tested against a programmed vocabulary of 103 words. After the ten subjects retrained the Threshold 600 system for the words which were misrecognized or rejected, the recognition error decreased to 1.96 percent. The rejection rates for both cases were less than 0.70 percent. Based on the results of the experiment, voice recognition technology and specifically the Threshold 600 voice recognition system were chosen to fulfill this MOTAS function. Author

N82-25238*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
AN AIRCRAFT SENSOR FAULT TOLERANT SYSTEM Interim Report
Alper K. Caglayan and Roy E. Lancraft Apr. 1982 113 p refs
(Contract NAS1-16579)
(NASA-CR-165876; NAS 1.26:165876; BBN-4858) Avail: NTIS HC A06/MF A01 CSCL 17G

The design of a sensor fault tolerant system which uses analytical redundancy for the Terminal Configured Vehicle (TCV) research aircraft in a Microwave Landing System (MLS) environment was studied. The fault tolerant system provides reliable estimates for aircraft position, velocity, and attitude in the presence of possible failures in navigation aid instruments and onboard sensors. The estimates, provided by the fault tolerant system, are used by the automated guidance and control system to land the aircraft along a prescribed path. Sensor failures are identified by utilizing the analytic relationship between the various sensor outputs arising from the aircraft equations of motion. E.A.K.

N82-25239*# Hampton Inst., Va.
[COST AND FUEL CONSUMPTION PER NAUTICAL MILE FOR TWO ENGINE JET TRANSPORTS USING OPTIM AND TRAGEN] Final Report
John F. Wiggs 30 Apr. 1982 280 p
(Grant NAG1-69)
(NASA-CR-168973; NAS 1.26:168973) Avail: NTIS HC A13/MF A01 CSCL 01C

The cost and fuel consumption per nautical mile for two engine jet transports are computed using OPTIM and TRAGEN. The savings in fuel and direct operating costs per nautical mile for each of the different types of optimal trajectories over a standard profile are shown. S.L.

N82-25240*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LEADING EDGE FLAP SYSTEM FOR AIRCRAFT CONTROL AUGMENTATION Patent Application
Dhanvada M. Rao, inventor (to NASA) (Old Dominion Univ.) Filed 10 Sep. 1981 15 p Sponsored by NASA
(NASA-Case-LAR-12787-1; US-Patent-Appl-SN-301078) Avail: NTIS HC A02/MF A01 CSCL 01C

Traditional roll control systems such as ailerons, elevons or spoilers are least effective at high angles of attack due to boundary layer separation over the wing. Independently deployed leading edge flaps on the upper surfaces of vortex stabilized wings are used to shift the center of lift outboard. A rolling moment is created that is used to control roll in flight at high angles of attack. The effectiveness of the rolling moment increases linearly with angle of attack. No adverse yaw effects are induced. In an alternate mode of operation, both leading edge flaps are deployed together at cruise speeds to create a very effective airbrake without appreciable modification in pitching moment. Little trim change is required. NASA

N82-25241*# National Aeronautics and Space Administration, Washington, D. C.
AERODYNAMICS/ACEE: AIRCRAFT ENERGY EFFICIENCY
1981 8 p refs
(NASA-Facts-94/8-81) Avail: NTIS HC A02/MF A01 CSCL 01C

An overview is presented of a 10 year program managed by NASA which seeks to make possible the most efficient use of energy for aircraft propulsion and lift as well as provide a technology that can be used by U.S. manufacturers of air transports and engines. Supercritical wings, winglets, vortex drag reduction, high lift, active control, laminar flow control, and aerodynamics by computer are among the topics discussed. Wind tunnel models in flight verification of advanced technology, and the design, construction and testing of various aircraft structures are also described. A.R.H.

N82-25242*# National Aeronautics and Space Administration, Washington, D. C.
MATERIALS AND STRUCTURES/ACEE
1981 8 p
(NASA-Facts-117/8-81) Avail: NTIS HC A02/MF A01 CSCL 01C

Light weight composites made from graphite fibers, glass, or man made materials held in an epoxy matrix, and their application to airframe design are reviewed. The Aircraft Energy Efficiency program is discussed. Characteristics of composites, acceptable risks, building parts and confidence, and aeroelastic tailoring are considered. N.W.

N82-25243# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
STATISTICAL REVIEW OF COUNTING ACCELEROMETER DATA FOR NAVY AND MARINE FLEET AIRCRAFT FROM 1 JANUARY 1962 TO 30 JUNE 1981 Semiannual Summary Report
Warren J. Williams 1 Nov. 1981 149 p
(AD-A110660; NADC-13920-2) Avail: NTIS HC A07/MF A01 CSCL 01/1

This is a semi-annual progress report, and it presents a specialized summary of the data in the counting accelerometer program. Statistics describing Navy and Marine aircraft cumulative g-count exceedances are calculated and tabulated. These tabulations are separated by calendar time and into four major categories of fleet experience: Navy Training, Navy Combat, Marine Training and Marine Combat. These data show that the load rate distributions (counts at 1000 hours) for most models and most g-levels have a non-normal distribution. Within a model (A-7E, F-4N, etc.) differences in the average load rates exist when data are separated by calendar time or mission category. Author (GRA)

N82-25244# San Antonio Air Logistics Center, Kelly AFB, Tex.
OV-10A NOSE GEAR FORK DAMAGE ANALYSIS Final Report, Aug. 1980 - Sep. 1981
Kenneth F. Barnes and James L. Haines Jan. 1982 49 p refs
(AD-A111492; SA-ALC/MM-7588) Avail: NTIS HC A03/MF A01 CSCL 03/1

A limited Damage Tolerance Analysis (DTA) of the OV-10A nose gear fork was performed to determine the fracture characteristics at a location on the underside of the fork in a machined fillet radius just aft of the jack point. The analysis included determination of a landing load history, finite element stress analysis, stress spectrum development, stress intensity solution, crack growth analysis, and residual strength calculations. Author (GRA)

N82-25245# Boeing Military Airplane Development, Seattle, Wash. Advanced Airplane Branch.
FIREPROOF BRAKE HYDRAULIC SYSTEM Final Report, Jun. 1980 - Jun. 1981
S. M. Warren and J. R. Kilner Wright-Patterson AFB, Ohio AFWAL Sep. 1981 391 p refs
(Contract F33615-80-C-2026; AF Proj. 3145)
(AD-A111319; AFWAL-TR-81-2080) Avail: NTIS HC A17/MF A01 CSCL 01/2

The feasibility of a fireproof two-fluid brake hydraulic system which utilizes nonflammable chlorotrifluoroethylene (CTFE) fluid in a dead ended brake hydraulic system mechanically isolated from the primary MIL-H-5606 hydraulic system was studied. Experimental brake system hardware was designed, built and laboratory tested. Results indicate that the fireproof two-fluid

Environmental fog/rain visual display system for aircraft simulators [NASA-CASE-ARC-11158-1] N82-24212

Airbus industry and noise in the community [SNIAS-821-111-111] N82-24739

OV-10A nose gear fork damage analysis [AD-A111492] N82-25244

Roll response criteria for transport aircraft with advanced flight control systems in the landing approach and touchdown [NLR-TR-80103-U] N82-25265

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Development of a control law for the alleviation of maneuver loads on an elastic aircraft A82-34144

Simulator for air-to-air combat versus real world: Visual cue analysis for simulated air-to-air combat training [AD-A110570] N82-25270

AIRCRAFT MODELS

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No-tail-rotor helicopter tests continue A82-33095

AIRCRAFT PARTS

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Fatigue life prediction of helicopter pitch link using Kaman life calculation methods A82-34125

Electro-hydraulic nose wheel steering of the Dornier 228 A82-34373

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The effect of very heavy rain upon aircraft and its role in wind shear attributed accidents N82-25179

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Opportunities for wind-tunnel/flight correlation with new Boeing airplanes N82-25206

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Calculation of the lift distribution and aerodynamic derivatives of quasi-static elastic aircraft A82-34639

Aerodynamic coefficient identification of time-varying aircraft system and its application A82-34645

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Standard tests for toughened resin composites --- for aircraft structures [NASA-RP-1092] N82-24301

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Mechanical properties of hot isostatic pressed P/M-titanium for helicopter components [MBB-UD-324-81-O] N82-25383

Panel Optimization with Integrated Software (POIS). Volume 1: PANDA: Interactive program for preliminary minimum weight design [AD-A110963] N82-25404

AIRCRAFT TIRES

Tire tread temperatures during antiskid braking and cornering on a dry runway [NASA-TP-2009] N82-24193

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 338 reports, journal articles, and other documents originally announced in August 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

An annual cumulative index will be published.

and that bureaucracy has been a much greater problem in recent projects than it was in the older ones. Major problems include the cult of systems management, excessive paperwork and meetings, the hardware competition process, and bureaucratic infighting. It is argued that there should be a return to the quick prototype and a single systems manager should preside over projects. Competition for project contracts should be curtailed. C.D.

A82-33049 * **Flight evaluation of Loran-C for general aviation area navigation.** W. M. Hollister, K. Natarajan, and J. A. Littlefield (MIT, Cambridge, MA). *Navigation,* vol. 28, Winter 1981-1982, p. 342-352. 12 refs. Grant No. NGL-22-009-640.

This paper reports on a flight evaluation of Loran-C which was part of a long range study of area navigation systems for general aviation. Tests involved two different Loran-C receivers, 6 different aircraft, and a variety of antennas. Uncorrected position fixes were typically accurate to one quarter mile. With measured corrections, repeatability was good to within 200 ft. Signal reliability was 99.7%. The receiver was not sensitive to atmospheric noise. The time difference grid demonstrated a long term stability of 0.3 microsecond. Vertical whip and ADF E-field antennas were found suitable for airborne use. Loran-C was found satisfactory for instrument approaches to runways at general aviation airports where published latitude-longitude coordinates were available. Accuracy was further improved by using locally measured Loran-C time difference coordinates. (Author)

A82-33050 **Applications of a multiplexed GPS user set.** C. R. Johnson, P. W. Ward, M. D. Turner, and S. D. Roemerman (Texas Instruments, Inc., Lewisville, TX). *Navigation,* vol. 28, Winter 1981-1982, p. 353-369. 7 refs.

A multiplexing GPS receiver has been developed that has many of the advantages of a continuous receiver at the low cost of a sequencing receiver. The multiplexing concept is explained. The receiver architecture is described. Advantages of multiplexing over the conventional receiver are highlighted. Applications of the multiplexing receiver to meet requirements now being met with single-channel, two-channel, and five-channel sets are discussed. Data comparing the performance of this multiplexing to conventional approaches are presented. A multiplexing GPS receiver solves difficult problems. Several of these applications are presented, including angle determination, single-channel differential GPS, area navigation and precision approach, and geodetic surveying. All applications examined have yielded a unique advantage with the multiplexed GPS receiver over a conventional GPS receiver. (Author)

A82-33095 **No-tail-rotor helicopter tests continue.** R. R. Ropelewski. *Aviation Week and Space Technology,* vol. 116, May 24, 1982, p. 57, 60, 61.

The experimental OH-6 helicopter uses a low-pressure air circulation yaw control system, in place of a conventional tail rotor, which consists of a small-diameter fan at the forward end of the tail boom, a slot on the lower right side of the boom, and selectively-controlled exhaust vanes at the extreme rear of the boom which provide direct thrust when additional yaw control is needed. A reduction in noise and vibration levels typical of conventional tail rotors has been demonstrated by the novel directional control system, and it is found that the helicopter's vertical tail becomes effective more quickly in forward flight. Confined-area operation hazards associated with conventional tail rotors have been obviated. Full directional control authority is maintained by the no-tail rotor system at speeds below 30 knots. O.C.

A82-33119 # **Fundamental torsional frequency of a class of solid wings.** E. H. Mansfield (Royal Aircraft Establishment, Farnborough, Hants., England). *AIAA Journal,* vol. 20, June 1982, p. 845-848.

This paper determines the fundamental torsional frequency of certain wings whose polar moment of inertia is proportional to the torsional rigidity at any section, as in a solid wing with a fixed t/c ratio. An inverse method of analysis is used in which the spanwise variation of rigidity and polar moment of inertia is related to an assumed spanwise variation of rotation in the fundamental torsional mode. The usefulness of this apparently hit-or-miss technique stems from the ease with which families of solutions may be generated. The results, which are augmented by a direct solution for wings with a constant taper, are expressed graphically in a form which relates the fundamental torsional frequency to the derived spanwise variation of the chord. (Author)

A82-33120 * # **Closed-form solutions of supersonic wing-body interference.** N. R. Vira and D.-N. Fan (Howard University, Washington, DC). *AIAA Journal,* vol. 20, June 1982, p. 855-857. Contract No. NAS5-24242.

Closed-form formulas are presented for the interference factors of a body in the presence of a wing at supersonic speeds, when a finite afterbody is introduced. In addition, formulas are obtained for those cases in which the base of the body is forward of the trailing edge of the exposed root chord. These formulas are shown to be valid, subject to the restrictions inherent in the formulation given by Pitts, Nielsen and Kaattari (1959). O.C.

A82-33125 **Aircraft evaluation in air network planning.** A. Kanafani and A. Ghobrial (California, University, Berkeley, CA). *ASCE, Transportation Engineering Journal,* vol. 108, May 1982, p. 282-300. 9 refs.

The relationship between aircraft technology and the structure of air service networks in short haul systems is investigated. The analysis is based on an optimal frequency assignment model that is integrated with a route choice model. Together these models allow the optimization of aircraft utilization and define an optimal network structure for a given demand pattern and aircraft technology. Large aircraft have a compelling advantage due to the scale economies they enjoy. Small aircraft, on the other hand, can offer level-of-service advantages and an opportunity for reducing the dependence on congested major transfer hubs in the network. A desirable technology development trend would be aimed at eliminating the diseconomies of distance suffered by small aircraft due to their limited payload-range characteristics. (Author)

A82-33143 # **Ideal ramjet - Optimum M sub infinity for fuel limit and material limit.** J. A. Roux (Mississippi, University, University, MS). *Journal of Spacecraft and Rockets,* vol. 19, May-June 1982, p. 286, 287.

The derivation of some simple algebraic expressions for the value of the freestream Mach number at which the specific impulse obtains a maximum for both the fuel-limited and material-limited cases is presented. Equations are given by which values of the freestream Mach number can be quickly determined. The dependence of this number on the increase in stagnation temperature due to combustion, on the maximum temperature, and on T sub infinity is given in explicit form. C.R.

A82-33250 **Principles of efficient energy use at Interflug (Grundsätze der rationellen Energieanwendung bei der Interflug).** K. Henkes (Ministerium für Verkehrswesen; Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt,* vol. 17, no. 5-6, 1981, p. 214-220. In German.

Attention is given to the problems of efficient energy use in civil aviation, taking into account conditions in the German Democratic Republic and its Interflug airline. It is pointed out that 98% of the energy requirements of Interflug are met with the aid of energy carriers produced from petroleum. These energy carriers are almost exclusively aircraft fuels, and 50% of the fuel is obtained in refueling operations conducted in foreign countries. Interflug has, therefore, been concerned with the implementation of approaches for reducing the performance-related fuel consumption for its aircraft. A reduction in performance-related fuel consumption of 10-16% for each aircraft type could be achieved. This reduction is partly the result of organizational steps leading to a more efficient utilization of the aircraft, and partly the result of a number of suitable technical-technological procedures. Plans are discussed for a further reduction of the requirements for fuel and electric power by a variety of different approaches. G.R.

A82-33274 **A documented example of strong wind-shear.** D. A. Membery (IAL, Bahrain). *Weather,* vol. 37, Jan. 1982, p. 19-22. 5 refs.

It is noted that wind variations likely to be encountered by an aircraft on takeoff or landing are usually estimated from a nearby anemometer some 33 ft above the runway. This wind, however, may not be representative of conditions at higher levels. An urgent need is therefore seen to detect and measure rapid changes in both the horizontal and vertical components up to 1000 ft. A device that can detect rapid velocity changes in clear air by remote sensing techniques is needed. Attention is given to the advances that have been made using a pulsed CO2 laser Doppler system. When an aircraft encounters a sudden decrease in headwind, the indicated airspeed drops by an equal amount. The subsequent lift is somewhat lower than the original value. To immediately correct the situation, power is applied so that the aircraft can regain lost airspeed and climb back to the glide path. The aircraft may at this juncture be in a critical position, where an increase in thrust produces only a slight increase in lift, accompanied by a tremendous increase in drag. C.R.

A82-33309 **Forward-swept-wing technology.** G. Warwick. *Flight International*, vol. 121, May 22, 1982, p. 1317-1319.

The demonstration X-29A forward-swept-wing airplane designed by Grumman is described, and other aspects of forward-swept-wing technology are discussed. The X-29A is powered by a single 16,000 lb thrust General Electric F404 turbofan engine, and combines forward sweep with close-coupled canard, digital fly-by-wire with relaxed static stability, aeroelastic tailoring with composite primary structure, and a thin supercritical airfoil with discrete variable camber. The wing has carbonfiber-epoxy skins and front spar, and a full-depth aluminum honeycomb substructure. Composite construction controls the nose-up twisting which forces the wing to diverge, and divergence speed is increased until it lies outside the X-29A's flight envelope. The wing can sustain higher pressures before shock-induced buffet appears, increasing the usable lift in transonic maneuvers. Canard, variable-camber flaperons and strake flaps are used to trim the aircraft. C.D.

A82-33317 * # **The cryogenic wind tunnel for high Reynolds number testing.** R. A. Kilgore (NASA, Langley Research Center, Hampton, VA). *International Cryogenic Engineering Conference, 9th, Kobe, Japan, May 11-14, 1982, Paper.* 7 p. 9 refs.

An improved way to increase the Reynolds numbers capability of wind tunnels has been developed at the Langley Research Center. Cooling the test gas to cryogenic temperatures by spraying liquid nitrogen into the tunnel circuit increases Reynolds number with no increase in dynamic pressure and a reduction in drive power. In addition, the ability to vary the temperature of the test gas independently of pressure and Mach number allows for the first time the independent determination of Reynolds number, Mach number, and aeroelastic effects. A new fan-driven transonic cryogenic tunnel being built at the Langley Research Center will provide an order of magnitude increase in Reynolds number capability over existing transonic tunnels in the United States when it is completed later this year. (Author)

A82-33318 * # **Generation of three-dimensional boundary-fitted curvilinear coordinate systems for wing/wing-tip geometries using the elliptic solver method.** F. C. Thames (NASA, Langley Research Center, Hampton, VA). *Symposium on the Numerical Generation of Curvilinear Coordinate Systems and the Use in the Numerical Solution of Partial Differential Equations, Nashville, TN, Apr. 13-16, 1982, Paper.* 23 p. 12 refs.

A three-dimensional elliptic solver technique is utilized to generate surface-fitted coordinates about wing/wing-tip configurations. The method is applicable to wings of arbitrary section profile and camber, leading-edge sweep, taper ratio, and spanwise thickness variation. The basic theory of three-dimensional elliptic mappings is developed along with a method to compute interior coordinate control functions. Examples of grids generated about several wing/wing-tip geometries are given. A 49 x 33 x 17 grid requires about 3 minutes of CPU time on a CYBER 203 computer. (Author)

A82-33325 * # **Aerodynamic interactions with turbulent jet exhaust plumes.** R. G. Wilmoth (NASA, Langley Research Center, Hampton, VA). *Joint Army-Navy-NASA-Air Force Interagency Propulsion Committee, Plume Technology Meeting, 13th, Houston, TX, Apr. 27-29, 1982, Paper.* 17 p. 14 refs.

The importance of aerodynamic interactions associated with external flow-field effects on turbulent jet exhaust plume structure is discussed. A viscous/inviscid prediction technique is presented which combines the overlaid mixing and inviscid plume components of the JANNAF Standardized Plume Flow-Field (SPF) model with inviscid external flow and boundary-layer analyses for treating nozzle afterbodies at subsonic/transonic speeds. Validation of the technique via comparisons between predictions and experiment for cold-air jet plumes is presented. Predicted spatial temperature distributions for hot, nonafterburning plumes are presented and compared to results obtained from more simplified prediction techniques in order to assess the importance of the aerodynamic interactions associated with external boundary layers and pressure gradients. It is demonstrated that these interactions play a significant role in determining the near-field turbulent mixing and inviscid plume shock structure. The implication of these results to plume radiation predictions is discussed. (Author)

A82-33326 * # **Status of the national transonic facility.** L. W. McKinney and B. B. Gloss (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerodynamic Testing Conference, 12th, Williamsburg, VA, Mar. 22-24, 1982, Paper 82-0604.* 11 p. 16 refs.

The National Transonic Facility at NASA Langley Research Center, scheduled for completion in July, 1982, is described with emphasis on model and instrumentation activities, calibration plans and some initial research plans. Performance capabilities include a Mach number range of 0.2-1.2, a pressure range of 1-9 atmospheres, and a temperature range of 77-350 K, which will produce a maximum Reynolds number of 120 million at a Mach number of 1.0, based on a 0.25 m chord. A comprehensive tunnel calibration program is planned, which will cover basic tunnel calibration, data qualities, and data comparisons with other facilites and flights. D.L.G.

A82-33327 * # **The NASA Langley laminar flow control airfoil experiment.** W. D. Harvey and J. D. Pride (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Aerodynamic Testing Conference, 12th, Williamsburg, VA, Mar. 22-24, 1982, Paper 82-0567.* 26 p. 45 refs.

A large chord swept supercritical LFC airfoil has been constructed for NASA-Langley's research program to determine the compatibility of supercritical airfoils with suction laminarization and to establish a technology base for future transport designs. Features include a high design Mach number and shock-free flow, as well as the minimization of the laminarization suction through a choice of airfoil geometry and pressure distribution. Two suction surface concepts and a variety of hybrid suction concepts involving combinations of natural and forced laminar flow are to be investigated. The test facility has been modified to insure achievement of required flow quality and transonic interference-free flow over the yawed LFC airfoil. D.L.G.

A82-33348 **Vertical takeoff technology - Flight mechanics, aerodynamics, and propulsion systems (Senkrechtstarttechnik - Flugmechanik, Aerodynamik, Antriebssysteme).** X. Hafer (Darmstadt, Technische Hochschule, Darmstadt, West Germany) and G. Sachs (München, Hochschule der Bundeswehr, Munich, West Germany). Berlin, Springer-Verlag, 1982. 419 p. 295 refs. In German. $34.50.

An efficient solution of the problem of vertical takeoff for an aircraft is provided by the helicopter. However, with respect to cruising flight operations, the helicopter cannot compete economically with aircraft utilizing conventional takeoff. A special type of aircraft, often called 'powered lift aircraft', is needed to combine the facility of vertical takeoff with the economic cruising flight capabilities found in conventional aircraft. This book is exclusively concerned with the design problems regarding such powered lift aircraft. The book has the objective to present a survey of the development of vertical takeoff technology. It provides also a description of the various possible approaches for a technical solution of the involved problems, taking into account the basic relations of aerodynamics and flight mechanics which have to be considered for the design of systems that provide a vertical-takeoff capability. G.R.

N82-24176*# National Aeronautics and Space Administration, Washington, D. C.

CURRENT DEVELOPMENTS LIGHTER THAN AIR SYSTEMS

Norman J. Mayer 1981 15 p refs Presented at the United Nations Ind. Develop. Organ. Conf., Vienna, 19-22 Oct. 1981
(NASA-TM-84744; NAS 1.15:84744) Avail: NTIS HC A02/MF A01 CSCL 01A

Lighter than air aircraft (LTA) developments and research in the United States and other countries are reviewed. The emphasis in the U.S. is on VTOL airships capable of heavy lift, and on long endurance types for coastal maritime patrol. Design concepts include hybrids which combine heavier than air and LTA components and characteristics. Research programs are concentrated on aerodynamics, flight dynamics, and control of hybrid types. Author

N82-24181# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

EFFECT OF MODIFICATION OF THE TRAILING EDGE OF A SEPARATING WALL ON THE DOWNSTREAM MIXING OF PARALLEL FLOWING STREAMS M.S. Thesis

Daniel J. Gurecki Dec. 1981 76 p refs
(AD-A111124; AFIT/GAE/AA/81D-12) Avail: NTIS HC A05/MF A01 CSCL 20/4

The objective of this thesis is to study ways to enhance the mixing of two parallel streams of air by modifying the trailing edge of a separating wall. An apparatus was designed which achieved two-dimensional, good quality flow near the center of the test section passage, with freestream turbulence intensity of 2.2 percent. Measurements of the wake were made varying the velocity of one stream down to 37.5 percent of the other stream velocity, both in and upstream of the asymptotic region of the wake. A single element hot wire was used to measure velocity and RMS readings. The flat plate trailing edge was then slotted with five, eight millimeter slots and re-tested. The higher turbulence and wider wake of the flat plate indicate that the slotted plate wake does not achieve as good mixing as the flat plate wake. No velocity ratio of the two streams was found to maximize the wake growth for either configuration. Wake growth doubled when the slower velocity was 0.40 of the faster velocity. Author (GRA)

N82-24182# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

AN EXPERIMENTAL INVESTIGATION OF THE FLOW FIELD OF AN EJECTOR WING DESIGN EMPLOYING A PHOTON CORRELATION LASER VELOCIMETER M.S. Thesis

Damon G. Stephens Dec. 1981 122 p refs
(AD-A111134; AFIT/GAE/AA/81D-30) Avail: NTIS HC A06/MF A01 CSCL 20/2

The flow field about a dual element airfoil model employing an ejector for aerodynamic blowing is investigated. Flow visualization is obtained by smoke tunnel testing. Mean velocities and turbulence intensities are determined at various flow field locations. All data is obtained through the use of a Laser Doppler Velocimeter (LDV) using a photon correlation processing scheme. Flow field properties are computed from the LDV generated autocorrelation function. The free stream velocity and Reynolds number based on model chord length are 8 m/sec and 325,000 respectively. Two ejector velocity ratios are investigated: (U) ejector/(U) free stream = 0. and 2. Flow visiualization photography is conducted at seven angles of attack: -5 deg, 0 deg, 5 deg, 10 deg, 15 deg, 20 deg, and 25 deg and LDV data is acquired at 0 deg and 15 deg angles of attack. The results are presented in the form of flow visualization photographs and profiles of mean velocities and turbulence intensities. Conclusions are drawn concerning the aerodynamic benefit of the ejector wing design for possible V/STOL applications. GRA

N82-24183# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Direction Etudes.

ACCOUNTING FOR THICKNESS EFFECTS IN THE CALCULATION OF SUBCRITICAL UNSTEADY AERODYNAMIC FORCES: APPLICATION TO WING-FUSELAGE INTERACTIONS [PRISE EN COMPTE DES EFFETS D'EPAISSEUR DANS LE CALCUL DES FORCES AERODYNAMIQUES INSTATIONNAIRES SURCRITIQUES. APPLICATIONS AUX INTERACTIONS FUSELAGE/SURFACES PORTANTES]

R. Barreau, M. Verdier, and J. P. Robert 7 Jan. 1982 47 p refs In FRENCH Presented at AAAF Colloq., Poitiers, France, 18-20 Nov. 1981
(SNIAS-821-111-108) Avail: NTIS HC A03/MF A01

A calculation method that yields an aerodynamic influence coefficient matrix for infinitely thin wings in a subsonic harmonic flow was modified in order to take into account the presence of a fuselage. A solution was obtained by the doublet lattice method and the method of singularites. Results relate to the development of generalized active control which requires a meticulous and precise knowledge of local unsteady aerodynamic forces. The computer program seems to give coherent results, the presence of a fuselage notably affecting the first chords of the wing. However, the method has not been sufficiently validated by calculations of aeroelastic significance. Author (ESA)

N82-24186*# Lockheed-California Co., Burbank.

TRANSPORT AIRCRAFT CRASH DYNAMICS Final Report, Jan. 1980 - Mar. 1982

Gil Wittlin, Max Gamon, and Dan Shycoff Atlantic City, N.J. FAA Mar. 1982 471 p refs
(Contract NAS1-16083)
(NASA-CR-165851; NAS 1.26:165851; FAA-CT-82-69) Avail: NTIS HC A20/MF A01 CSCL 01C

Transport airplane accident data is presented. Formulation of candidate crash scenarios, the identification of the involvement of structural systems and subsystems in transport airplane accidents, a review of existing design criteria and philosophy, and conclusions and recommendations for R&D are included. The accident is organized in relation to pertinent accident types including undershoot, overrun, ground collision, obstacle impact, stall, wheels up or retracted landing, swerve and gear collapse. Ground to ground and air to ground crash scenarios are presented. Current state of the art procedures are used in .he analysis of a current airplane configuration for selected accident conditions. Available structure and occupant modeling techniques are assessed with regard to transport airplane crash dynamics modeling requirements. Design criteria and full scale crash tests are evaluated with regard to transport airplane applicability. A integrated crash dynamics analysis and test program for transport airplanes is presented along with conclusions and recommendations based on the results of the overall study. An accident data base computer program is described. S.L.

N82-24188# Auburn Univ., Ala. Dept. of Electrical Engineering.

MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEM (MATCALS INVESTIGATION), VOLUME 1

E. R. Graf, C. L. Phillips, and S. A. Starks Sep. 1981 396 p refs Prepared for Georgia Inst. of Technology, Atlanta 2 Vol.
(Contracts N00039-80-C-0032; N66314-73-C-0565;
N66314-74-C-1362; N66314-74-C-1634;
N00228-75-C-2080; N00228-76-C-2069;
N00228-78-C-2233)
(AD-A110862; GIT/EES-1-A-2550-Vol-1) Avail: NTIS HC A17/MF A01 CSCL 17/7

This report contains the results of the continuation of Marine Air Traffic Control and Landing System (MATCALS) investigations. The report is organized into three main sections, namely Part Two, Part Three, and Part Four. Part Two presents a method of estimating the centroid location of a target utilizing a scan return amplitude versus angle information. Part Three contains the results of an investigation into replacing the alpha-beta filter in the MATCAL digital controller with an observer, in order to reduce the effects of radar noise. Part Four presents the results of an investigation into replacing the same alpha-beta filter with a tri-state adaptive filter, in order to reduce the effects of radar noise. GRA

N82-24189# Auburn Univ., Ala. Dept. of Electrical Engineering.

MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEM (MATCALS INVESTIGATION), VOLUME 2

E. R. Graf, C. L. Phillips, and S. A. Starks Sep. 1981 155 p refs Prepared for Georgia Inst. of Technology, Atlanta 2 Vol.
(AD-A110863; GIT/EES-1-A-2550-Vol-2) Avail: NTIS HC A08/MF A01 CSCL 17/7

Three observers, designed for a reduced order system that represents the lateral system of F4J aircraft in an automatic landing configuration, are discussed. The observers are to be used in the aircrafts' lateral control system to estimate its lateral position and lateral velocity. Results obtained from simulation studies indicate that an observer may be used to improve the system's response. M.D.K.

N82-24192# Fondazione Ugo Bordoni, Rome (Italy).
ROUND TABLE DISCUSSION ON THE TRANSFER OF RESULTS FROM THE PROJECT 'AIDS TO NAVIGATION AND CONTROL OF AIR TRAFFIC' Final Report [TAVOLA ROTONDA SUL TRASFERIMENTO DEI RISULTATI DEL PROGETTO FINALIZZATO 'AIUTI ALLA NAVIGAZIONE E CONTROLLO DEL TRAFFICO AEREO']
Francesco Valdoni 1981 20 p In ITALIAN Presented at Rome, 27 Mar. 1981; sponsored by CNR
(FUB-20-ATC-1981) Avail: NTIS HC A02/MF A01

The transfer of results from a project was discussed. Their contributions are summarized. The main subjects include assistance to national planning of navigation aids and traffic control, consultancy to state agencies, propositions to present to the International Civil Aviation Organization, marketing of Italian products derived from project research, and research planning after the project. Author (ESA)

N82-24193*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
TIRE TREAD TEMPERATURES DURING ANTISKID BRAKING AND CORNERING ON A DRY RUNWAY
John A. Tanner, Robert C. Dreher, Sandy M. Stubbs, and Eunice G. Smith May 1982 57 p refs
(NASA-TP-2009; L-15110; NAS 1.60:2009) Avail: NTIS HC 04/MF A01 CSCL 01C

Aircraft tire tread temperatures under transient conditions associated with antiskid braking and cornering operations were studied. Peak tread temperatures were shown to be much lower when the braking effort did not reach the incipient skid point than when the tire was forced into incipient skids. Braking operation at high yaw angles increased average tread temperatures. Tire energy dissipation associated with braking and cornering was far greater than that associated with wheel spin-up at touchdown. The maximum friction level developed by a worn tire is shown to be more sensitive to variations in tread temperature and ground speed than that developed by a new tire. Locked-wheel skids and braking and cornering operations at high yaw angle produced molten rubber deposits on the runway surface and tread temperatures high enough to cause the rubber to undergo changes in chemial composition. R.J.F.

N82-24194*# Textron Bell Helicopter, Fort Worth, Tex.
V/STOL TILT ROTOR RESEARCH AIRCRAFT. VOLUME 1: GENERAL INFORMATION, REVISION C
Mike Kimbell and Aaron Whitener 8 Aug. 1980 357 p refs 4 Vol.
(Contract NAS2-7800)
(NASA-CR-166347; NAS 1.26:166347; REPT-301-099-022C) Avail: NTIS HC A16/MF A01 CSCL 01C

The configuration, operation and maintenance requirements for the contractor-furnished portion of the XV-15 research instrumentation and data acquisition system are defined. Descriptions of systems operation, maintenance and checkout procedures, and cable designations are given. R.J.F.

N82-24195*# Textron Bell Helicopter, Fort Worth, Tex.
V/STOL TILT ROTOR RESEARCH AIRCRAFT. VOLUME 2: SHIP 1 INSTRUMENTATION
11 Aug. 1978 456 p refs Sponsored by NASA 4 Vol.
(NASA-CR-166348; NAS 1.26:166348) Avail: NTIS HC A20/MF A01 CSCL 01C

Information covering sensor cables, sensor installation, and sensor calibration for the XV-15 aircraft number 1 is included. For each junction box (J-box) designation there is a schematic of the J-box disconnect harness instrumentation worksheets which show sensor location, and calibration data sheets for each sensor associated with that J-box. An index of measurement item codes to J-box locations is given in a table. Cross references are given. R.J.F.

N82-24196*# Textron Bell Helicopter, Fort Worth, Tex.
V/STOL TILT ROTOR RESEARCH AIRCRAFT. VOLUME 3: SHIP 2 INSTRUMENTATION
11 Aug. 1978 579 p refs Sponsored by NASA 4 Vol.
(NASA-CR-166349; NAS 1.26:166349) Avail: NTIS HC A25/MF A01 CSCL 01C

Information covering sensor cables, sensor installation, and sensor calibration for the XV-15 aircraft number 2 is included. For each junction box (J-box) designation there is a schematic of the J-box disconnect harness, instrumentation worksheets which show sensor location, and calibration data sheets for each sensor associated with that J-box. An index of measurement data codes to J-box locations is given in a table. Cross references are given. R.J.F.

N82-24197*# Textron Bell Helicopter, Fort Worth, Tex.
V/STOL TILT ROTOR RESEARCH AIRCRAFT. VOLUME 4: CFE TECHNICAL DATA
1 Oct. 1980 319 p refs Sponsored by NASA
(NASA-CR-166350; NAS 1.26:166350) Avail: NTIS HC A14/MF A01 CSCL 01C

Manufacturer drawings and specifications for contractor furnished transducers and related equipment for the XV-15 aircraft research instrumentation and data acquisition system are given. R.J.F.

N82-24198# Texas A&M Univ., College Station. Dept. of Mechanical Engineering.
DEVELOPMENT OF EXPERIMENTALLY COMPATIBLE SUBSYSTEM METHODS FOR THE ANALYSIS OF AIRCRAFT STRUCTURES Final Report, 1 Apr. - 30 Sep. 1981
Sherif T. Noah Nov. 1981 50 p refs
(Grant AF-AFOSR-0141-81)
(AD-A111242; AFOSR-82-0080TR) Avail: NTIS HC A03/MF A01 CSCL 01/3

This study is directed toward the development of experimentally compatible synthesis techniques for the determination of the dynamic characteristics of structures from the characteristics of their components. Based on an assessment of existing methods, selected free-interface component mode methods are utilized for the development. A simple technique is developed by which the residual effects, of truncated substructures' modes, required in forming the synthesis can be directly determined from test data. The data is to be obtained by shaking each of the substructures at a single point. Depending on the type of substructures involved, the inclusion of these residual effects is shown to be very significant in drastically improving the predicted model shapes and damping of their assembly. A method is also presented for extending the selected synthesis formulations to enable their application to non-proportionally damped substructures. The study summarized in this report clearly demonstrates the feasibility of developing general, experimentally compatible synthesis techniques. Recommendations are included for the generalization and further development of the techniques developed in this study. Author (GRA)

N82-24199# Kaman Aerospace Corp., Windsor, Conn.
EXPERIMENTAL VERIFICATION OF FORCE DETERMINATION AND GROUND FLYING ON A FULL-SCALE HELICOPTER Final Report, May 1977 - Dec. 1980
R. Jones, W. G. Fennelly, E. J. Nagy, and J. A. Fabunmi May 1981 164 p refs
(Contract DAAJ02-77-C-0027; DA Proj. 1L2-62209-AH-76)
(USAAVRADCOM-TR-81-D-11; R-1625) Avail: NTIS HC A08/MF A01

Force determination is a method of obtaining dynamic loads acting on a vehicle in flight. These loads were determined from measured fuselage responses obtained in flight and calibration matrices obtained in a shake test. These forces obtained were verified by ground flying in a hangar and duplicated the responses obtained in flight. Author

N82-24201*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A PIECEWISE LINEAR STATE VARIABLE TECHNIQUE FOR REAL TIME PROPULSION SYSTEM SIMULATION
James R. Mihaloew and Stephen P. Roth (Pratt and Whitney Aircraft Group, West Palm Beach, Fla.) 1982 16 p refs Presented at the 13th Ann. Pittsburgh Conf. on Modelling and Simulation, Pittsburgh, 22-23 Apr. 1982; sponsored by IEEE, ISA, SCS and SMCS
(NASA-TM-82851; E-1210; NAS 1.15:82851) Avail: NTIS HC A02/MF A01 CSCL 21E

The emphasis on increased aircraft and propulsion control system integration and piloted simulation has created a need for higher fidelity real time dynamic propulsion models. A real time propulsion system modeling technique which satisfies this need and which provides the capabilities needed to evaluate propulsion system performance and aircraft system interaction brake hydraulic system concept is feasible, and the basic operation, control characteristics and stability of the brake system are not affected by the two-fluid configuration. The increased density of the CTFE fluid does not cause the hydraulic system to respond slower resulting in longer aircraft stopping distances. However, analysis indicates that the performance lost by changing to the CTFE fluid can be regained by increasing brake hydraulic line sizes and returning the antiskid control box. Author (GRA)

N82-25248# Arinc Research Corp., Annapolis, Md.
IMPROVEMENT PROGRAM FOR THE C-141 NAVIGATION SELECTOR PANEL Final Engineering Report
Henry L. Riser, Jr. Jan. 1982 20 p
(Grant F09603-80-G-3338-0012)
(AD-A111469; Rept-2315-11-1-2635) Avail: NTIS HC A02/MF A01 CSCL 01/4

This report presents the results of an engineering study to improve the reliability and maintainability of the Navigation Selector Panel, Part Number 75-89181, NSN 6605-01-038-6849JH, used in all models of the C-141 aircraft. The work described in this document was performed for the U. S. Air Force and specifically for the Reliability Engineering Branch, Item Management Division, MMIRCA-4, of Robins Air Force Base, Georgia, 31098. Maintenance data covering one year were obtained and analyzed. The items most often replaced were the lighted push-button switches in the assembly caused by poor switch design. Changes were recommended. Author (GRA)

N82-25249# Arinc Research Corp., Annapolis, Md.
ELECTRONIC WARFARE AVIONICS INTEGRATION SUPPORT FACILITY SUPPORT PROCESSOR Final Report
C. J. Manspeaker, F. M. Stamps, and C. W. Strack Nov. 1981 217 p refs
(Grant F09603-80-G-3338-0011)
(AD-A111641; Rept-2311-11-1-2568) Avail: NTIS HC A10/MF A01 CSCL 09/3

ARINC Research was tasked to perform a long-range study of the functional and system requirements of the Electronic Warfare Avionics Integration Support Facility (EWAISF) support processor. This document describes the results of the four phases of that effort: the definition of functional requirements for data processing equipment (ADPE) and Software, identification of alternative architectures to fulfill these requirements, and a cost benefit analysis of the alternatives. Also recommendations for implementing a preferred architecture and describes a means for updating the study are given. Author (GRA)

N82-25250*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STGSTK: A COMPUTER CODE FOR PREDICTING MULTISTAGE AXIAL FLOW COMPRESSOR PERFORMANCE BY A MEANLINE STAGE STACKING METHOD
Ronald J. Steinke May 1982 65 p refs
(NASA-TP-2020; E-551; NAS 1.60:2020) Avail: NTIS HC A04/MF A01 CSCL 21E

A FORTRAN computer code is presented for off-design performance prediction of axial-flow compressors. Stage and compressor performance is obtained by a stage-stacking method that uses representative velocity diagrams at rotor inlet and outlet meanline radii. The code has options for: (1) direct user input or calculation of nondimensional stage characteristics; (2) adjustment of stage characteristics for off-design speed and blade setting angle; (3) adjustment of rotor deviation angle for off-design conditions; and (4) SI or U.S. customary units. Correlations from experimental data are used to model real flow conditions. Calculations are compared with experimental data. Author

N82-25251*# National Aeronautics and Space Administration. Washington, D. C.
PROPULSION/ACEE
1981 12 p
(NASA-Facts-93/8-81) Avail: NTIS HC A02/MF A01 CSCL 21E

The research objectives of the NASA aircraft energy efficiency program are summarized. Engine component improvements for turbofan engines, diagnostics, the development of advanced turboprop engines, and propeller noise analysis are discussed. M.G.

N82-25252*# Pennsylvania State Univ., University Park. Lab. of Turbomachinery.
THREE DIMENSIONAL MEAN VELOCITY AND TURBULENCE CHARACTERISTICS IN THE ANNULUS WALL REGION OF AN AXIAL FLOW COMPRESSOR ROTOR PASSAGE
R. Davino and B. Lakshminarayana May 1982 262 p refs
(Grant NsG-3212)
(NASA-CR-169003; NAS 1.26:169003; PSU/TURBO-82-2) Avail: NTIS HC A12/MF A01 CSCL 21E

The experiment was performed using the rotating hot-wire technique within the rotor blade passage and the stationary hot-wire technique for the exitflow of the rotor blade passage. The measurements reveal the effect of rotation and subsequent flow interactions upon the rotor blade flowfield and wake development in the annulus-wall region. The flow near the rotor blade tips is found to be highly complex due to the interaction of the annulus-wall boundary layer, the blade boundary layers, the tip leakage flow, and the secondary flow. Within the blade passage, this interaction results in an appreciable radial inward flow as well as a defect in the mainstream velocity near the mid-passage. Turbulence levels within this region are very high. This indicates a considerable extent of flow mixing due to the viscous flow interactions. The size and strength of this loss core is found to grow with axial distance from the blade trailing edge. The nature of the rotor blade exit-flow was dominated by the wake development. T.M.

N82-25253*# Pennsylvania State Univ., University Park. Lab. of Turbomachinery.
INVESTIGATION OF THE TIP CLEARANCE FLOW INSIDE AND AT THE EXIT OF A COMPRESSOR ROTOR PASSAGE
A. Pandya and B. Lakshminarayana May 1982 147 p refs
(Grant NsG-3212)
(NASA-CR-169004; NAS 1.26:169004; PSU/TURBO-82-3) Avail: NTIS HC A07/MF A01 CSCL 21E

The nature of the tip clearance flow in a moderately loaded compressor rotor is studied. The measurements were taken inside the clearance between the annulus-wall casing and the rotor blade tip. These measurements were obtained using a stationary two-sensor hot-wire probe in combination with an ensemble averaging technique. The flowfield was surveyed at various radial locations and at ten axial locations, four of which were inside the blade passage in the clearance region and the remaining six outside the passage. Variations of the mean flow properties in the tangential and the radial directions at various axial locations were derived from the data. Variation of the leakage velocity at different axial stations and the annulus-wall boundary layer profiles from passage-averaged mean velocities were also estimated. B.W.

N82-25254*# General Electric Co., Evendale, Ohio. Materials and Processes Technology Labs.
COST/BENEFIT STUDIES OF ADVANCED MATERIALS TECHNOLOGIES FOR FUTURE AIRCRAFT TURBINE ENGINES: MATERIALS FOR ADVANCED TURBINE ENGINES
M. Stearns and L. Wilbers May 1982 49 p
(Contract NAS3-20074)
(NASA-CR-167849; NAS 1.26:167849) Avail: NTIS HC A03/MF A01 CSCL 21E

Cost benefit studies were conducted on six advanced materials and processes technologies applicable to commercial engines planned for production in the 1985 to 1990 time frame. These technologies consisted of thermal barrier coatings for combustor and high pressure turbine airfoils, directionally solidified eutectic high pressure turbine blades, (both cast and fabricated), and mixers, tail cones, and piping made of titanium-aluminum alloys. A fabricated titanium fan blisk, an advanced turbine disk alloy with improved low cycle fatigue life, and a long-life high pressure turbine blade abrasive tip and ceramic shroud system were also analyzed. Technologies showing considerable promise as to benefits, low development costs, and high probability of success were thermal barrier coating, directionally solidified eutectic turbine blades, and abrasive-tip blades/ceramic-shroud turbine systems. R.J.F.

N82-25255*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXHAUST EMISSIONS SURVEY OF A TURBOFAN ENGINE FOR FLAME HOLDER SWIRL TYPE AUGMENTORS AT SIMULATED ALTITUDE FLIGHT CONDITIONS
John E. Moss, Jr. Oct. 1981 47 p refs

(NASA-TM-82787; E-955; NAS 1.15:82787) Avail: NTIS HC A03/MF A01 CSCL 21E

Emissions of carbon dioxide, total oxides of nitrogen, unburned hydrocarbons, and carbon monoxide from an F100 afterburning two spool turbofan engine at simulated flight conditions are reported. Tests were run at Mach 0.8 at altitudes of 10.97 and 13.71 km (36,000 and 45,000 ft), and at Mach 1.2 at 13.71 km (45,000 ft). Emission measurements were made from intermediate power (nonafterburning) through maximum afterburning, using a single point gas sample probe traversed across the horizontal diameter of the exhaust nozzle. The data show that emissions vary with flight speed, altitude, power level, and radial position across the nozzle. Carbon monoxide emissions were low for intermediate and partial afterburning power. Unburned hydrocarbons were near zero for most of the simulated flight conditions. At maximum afterburning, there were regions of NOx deficiency in regions of high CO. The results suggest that the low NOx levels observed in the tests are a result of interaction with high CO in the thermal converter. CO2 emissions were proportional to local fuel air ratio for all test conditions.
T.M.

N82-25256*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.
DEVELOPMENT OF AN ANALYTICAL TECHNIQUE FOR THE OPTIMIZATION OF JET ENGINE AND DUCT ACOUSTIC LINERS Final Technical Report, 1 Mar. 1981 - 28 Feb. 1982
Ben T. Zinn and William L. Meyer 28 Feb. 1982 159 p refs
(Grant NAG1-133)
(NASA-CR-169002; NAS 1.26:169002) Avail: NTIS HC A08/MF A01 CSCL 21E

A new method was developed for the calculation of optimum constant admittance solutions for the minimization of the sound radiated from an arbitrary axisymmetric body. This method utilizes both the integral equation technique used in the calculation of the optimum non-constant admittance liners and the independent solution generated as a by product of these calculations. The results generated by both these methods are presented for three duct geometries: (1) a straight duct; (2) the QCSEE inlet; and (3) the QCSEE inlet less its centerbody.
Author

N82-25257*# United Technologies Corp., East Hartford, Conn. Commercial Products Div.
FRACTURE MECHANICS CRITERIA FOR TURBINE ENGINE HOT SECTION COMPONENTS Final Report
G. J. Meyers May 1982 123 p refs
(Contract NAS3-22550)
(NASA-CR-167896; NAS 1.26:167896; PWA-5772-23) Avail: NTIS HC A06/MF A01 CSCL 21E

The application of several fracture mechanics data correlation parameters to predicting the crack propagation life of turbine engine hot section components was evaluated. An engine survey was conducted to determine the locations where conventional fracture mechanics approaches may not be adequate to characterize cracking behavior. Both linear and nonlinear fracture mechanics analyses of a cracked annular combustor liner configuration were performed. Isothermal and variable temperature crack propagation tests were performed on Hastelloy X combustor liner material. The crack growth data was reduced using the stress intensity factor, the strain intensity factor, the J integral, crack opening displacement, and Tomkins' model. The parameter which showed the most effectiveness in correlation high temperature and variable temperature Hastelloy X crack growth data was crack opening displacement.
S.L.

N82-25259# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Ramjet Technology Branch.
COAXIAL DUMP RAMJET COMBUSTOR COMBUSTION INSTABILITIES. PART 1: PARAMETRIC TEST DATA Interim Report, Feb. 1979 - Mar. 1980
D. L. Davis Jul. 1981 333 p refs 2 Vol.
(AF Proj. 2308)
(AD-A111355; AFWAL-TR-81-2047-Pt-1) Avail: NTIS HC A15/MF A01 CSCL 21/5

This report contains Combustion Instability Data for Coaxial Dump Ramjet Combustors. The data includes pressure vs. time, RMS pressure spectrums, peak and broadband RMS pressures, and related steady state performance data. Analysis and interpretation of the data are reserved for future reports. Also included is a description of RMS pressure and its relation to wave shape.
Author (GRA)

N82-25260# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.
NEW DEVELOPMENTS IN THE FIELD OF RAMJET MISSILE PROPULSION [NEUE ENTWICKLUNGEN AUF DEM GEBIET DER FLUGKOERPER-STAUANTRIEBE]
H.-L. Weinreich 12 Nov. 1981 65 p refs In GERMAN
(MBB-UR-516-81-O) Avail: NTIS HC A04/MF A01

Various supersonic ramjets are discussed which were proposed for the propulsion systems of tactical missiles with higher average velocities. Design and general operating characteristics of ramjet engines are reviewed. The interaction between intake system and ramjet combustion chamber performance is treated with reference to throttling schemes. Ramjet engines, using liquid or solid propellant, as well as solid fuel ramrockets are studied. Experimentally proven performance of ramjet designs is cited and technological trends are identified. Development results concern fuel, inlet systems, variable thrust chokes; and ramjet combustion chamber/integral booster configurations.
Author (ESA)

N82-25261*# National Aeronautics and Space Administration, Washington, D. C.
GUIDANCE AND CONTROL/ACEE
1981 8 p
(NASA-Facts-95/8-81) Avail: NTIS HC A02/MF A01 CSCL 01C

Active controls improve airplane performance by stabilizing its flight, reducing departures from stable flight, and alleviating loads imposed by external forces such as gusts, turbulence, or maneuvers. Some uses for active control systems, the design of redundant and reliable stability augmentation systems, digital fly-by-wire, and NASA assessments of the technology of sensors and actuators are discussed. A series of trade-off studies to better define optimum flight control systems, and research by drone and full-scale models are described.
A.R.H.

N82-25262*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BARRIERS AND DISPERSAL SURFACES IN MINIMUM-TIME INTERCEPTION
N. Rajan and M. D. Ardema May 1982 34 p refs
(NASA-TM-84241; A-8912; NAS 1.15:84241) Avail: NTIS HC A03/MF A01 CSCL 01C

Minimum time interception of a target moving in a horizontal plane is analyzed as a one-player differential game. Dispersal points and points on the barrier are located for a class of pursuit evasion and interception problems. These points are determined by constructing cross sections of the isochrones and hence obtaining the barrier, dispersal, and control level surfaces. The game solution maps the controls as a function of the state within the capture region.
J.D.

N82-25263# Washington Univ., St. Louis, Mo. Dept. of Mechanical Engineering.
OPTIMIZATION OF AUTO-PILOT EQUATIONS FOR RAPID ESTIMATION OF HELICOPTER CONTROL SETTINGS Interim Technical Report, Jul. 1980 - Nov. 1981
Han-Sheng Chen and David A. Peters Nov. 1981 29 p refs
(Contract DAAG29-80-C-0092)
(AD-A110739; ARO-17067.1-E; ITR-1) Avail: NTIS HC A03/MF A01 CSCL 01/1

An automatic feedback system, based on continuous monitoring of control loads, is used to find the control settings that are required to obtain a given flight condition of a helicopter rotor. A program is developed that searches automatically for the optimum gains and time constants of the system. Satisfactory results are achieved for given conditions as an example.
Author (GRA)

N82-25264# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
USE OF THE PSEUDO-INVERSE FOR DESIGN OF A RECONFIGURABLE FLIGHT CONTROL SYSTEM M.S. Thesis
Syed Javed Raza Dec. 1981 156 p refs
(AD-A111172; AFIT/GAE/AA/81D-23) Avail: NTIS HC A08/MF A01 CSCL 01/3

Reconfiguration of the flight control system is achieved using generic inputs and transformation matrices for single primary control surface failure. Pseudo-inverse is used to evaluate appropriate transformation matrices. Design is tested against non-linear six degree-of-freedom model of the A-7D by simulating

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A82-33387 † **Aerodynamics. Part 2 - Methods of aerodynamic design /3rd revised and enlarged edition/ (Aerodinamika. Part 2 - Metody aerodinamicheskogo rascheta /3rd revised and enlarged edition/).** N. F. Krasnov. Moscow, Izdatel'stvo Vysshaia Shkola, 1980. 416 p. 53 refs. In Russian.

Methods for determining the aerodynamic characteristics of aircraft and aircraft components are discussed. Analysis is carried out for supersonic flow around pointed and blunt conical surfaces and thin-walled bodies of revolution at small angles of attack (linearized problems). Methods for calculating friction and heat transfer are examined. Attention is also given to the determination of aerodynamic parameters of aircraft for the combinations fuselage-wing and fuselage-wing-empennage (control surfaces) with allowance for interference effects. Finally, the aerodynamics of rarified gases is discussed. V.L.

A82-33514 # **Downwash behind a wing with spanwise blowing.** P. R. Kumar and E. G. Tulapurkara (Indian Institute of Technology, Madras, India). *Aeronautical Society of India, Journal*, vol. 32, Feb.-Nov. 1980, p. 105-108. 7 refs.

A theoretical estimate of downwash using Campbell's (1975) data on lift distributions on trapezoidal wings is presented. An indirect method is used to obtain circulation distributions, which are worked out for different values of the blowing coefficient using the vortex lattice method of Hedman (1966). Downwash behind the wing increases rapidly with increase in the blowing coefficient, and a value for the blowing coefficient is found for which the tail contribution to stability will be zero. Thus, the wing contribution to stability increases with blowing and the net decrease in stability is lower. D.L.G.

A82-33515 # **Finite element analysis of some aerospace shell structures.** S. Viswanath, S. S. Murthy, and C. G. Shah (National Aeronautical Laboratory, Bangalore, India). *Aeronautical Society of India, Journal*, vol. 32, Feb.-Nov. 1980, p. 109-115. 9 refs.

A computer program LINSHL is developed for the linear static analysis of stiffened shell structures. The program incorporates a high precision triangular cylindrical shell element, a high precision triangular shallow shell element, a curved beam element and a straight beam element. Numerical results are presented for the stress analysis of practical structures such as a ring-stiffened cylinder and a canopy hood of a typical aircraft, and are found to be in reasonable agreement with alternate solution methods. D.L.G.

A82-33520 # **Design, fabrication and testing of an electrical analogue for heat transfer to coated turbine blade.** P. R. Joshi and W. V. Nabar (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 32, Feb.-Nov. 1980, p. 133-136.

The analog method is described for the study of heat transfer to a coated solid turbine blade. The method is based on the fact that the governing equations for heat conduction in an isotropic, homogeneous nonheat- generating body under steady state conditions are the same as those governing the steady state distribution of electrical potential. The analog can be used to obtain the temperature distribution over the cross section of different blades coated or otherwise for various operating conditions. A schematic diagram of the electrical analog for heat transfer to a coated turbine blade is presented, and the design and fabrication of the analog is discussed. D.L.G.

A82-33523 # **Primary sewage treatment plant as a source of bird hazards at airport.** S. C. Pillai, M. K. C. Sridhar, and G. K. Viswanath (CIERS Research and Consultancy Private, Ltd., Bangalore, India). *Aeronautical Society of India, Journal*, vol. 32, Feb.-Nov. 1980, p. 149-153. 8 refs.

A82-33542 **From the A 300 to the A 310 (De l'A 300 à l'A 310).** R. Deque and D. Puyplat (Société Nationale Industrielle Aérospatiale, Division Avions, Paris, France). *L'Aéronautique et l'Astronautique*, no. 93, 1982, p. 3-18. In French.

The subcontractor assignments and the evolutionary changes which produced the A 310 from the A 300 Airbus are described. Each subcontractor delivered parts in a maximal state of integration to the final assembly plant, which is intended to produce 8-10 aircraft/mo. The results of numerical modeling of the aerodynamic performance of the A 300 in subsonic/supersonic shock configurations led to a thickening of the wing near the root, in addition to a 16 percent reduction in total wing area, a 14 percent increase in wing length to reduce drag, and a higher cruising altitude. Composite materials were employed for the spoilers, airbrakes, the rudder, motor nacelles, etc., along with new, lightweight aluminum-zinc alloys for the longerons. Controls have been computerized and CRTs are in place in the cockpit instrument panel. Details of the instrumentation displays are provided. M.S.K.

A82-33543 **The beginning of the ATR 42 program and its importance (Le lancement du programme ATR 42 et ses conséquences).** A. Etesse (Société Nationale Industrielle Aérospatiale, Division Avions, Paris, France). *L'Aéronautique et l'Astronautique*, no. 93, 1982, p. 19-22. In French.

Marketing and flight economy goals have led to the development of the ATR 42-100 and 42-200 dual turboprop aircraft for carrying 42 or 49 passengers 1300 or 1450 km, respectively. An increase in comuter air traffic of 20-30 percent every year in France and 12 percent in the U.S. are cited as the driving force for the development of the new aircraft. The physical capabilities of the ATR are 15 tons weight, a flying range of 1350 km with 42 passengers, a cruise speed of 513 km/hr, an altitude of 13,400 ft on one motor, and a runway requirement of 900 m. The aircraft is a joint effort of the French and Italian governments, following an accord signed in 1980 to establish a common carrier. A P.W. 100/2 will initially power the plane until 1985, when a motor which allows the passenger number to increase to 50-60 will be introduced. M.S.K.

A82-33544 **Aircraft lightning protection (Protection des aéronefs contre la foudre).** J. Taillet (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *L'Aéronautique et l'Astronautique*, no. 93, 1982, p. 37-52. 40 refs. In French.

Currently known effects of lightning on aircraft and interior components are reviewed, along with measures which must be taken in order to make the broad use of composites acceptable in future aircraft. The types of accident lightning strikes have inflicted on USAF aircraft in the period 1970-1980 are examined, noting that catastrophic failures occurred due to damage to the control and navigation systems, electronics, and explosions of fuel or armaments. The introduction of increasing amounts of composite materials in the aircraft structures, parts which may cause resistance to the lightning path, and the use of electronic controls which can be degraded by electromagnetic pulses pose difficulties when the introduction of cost-saving measures is also life-endangering. The points of lightning attachment are examined, along with the effects on the aircraft components. It is recommended that composite parts be covered with a thin metallic film which conducts the current freely away from the composite, and that microelectronic circuitry be hardened against EMP. M.S.K.

A82-33547 **Simulation reaches towards reality.** D. Boyle. *Interavia*, vol. 37, May 1982, p. 451-453.

It is noted that the greatest progress is being made in the area of visual simulation, offering the possibility of considerable savings to airlines. The microcircuit has made it possible to develop computer-generated imagery (CGI) systems. A single simulator can provide a tremendous variety of airfield representations. Once the software has been developed for a given location, it can be furnished to many simulators by simply copying a tape or disk recording. A description is given of daylight CGI. C.R.

A82-33571 * **Accurate numerical solution of compressible, linear stability equations.** M. R. Malik (High Technology Corp., Hampton, VA), S. Chuang (George Washington University, Hampton, VA), and M. Y. Hussaini (Institute for Computer Applications in Science and Engineering, Hampton, VA). *Zeitschrift für angewandte Mathematik und Physik*, vol. 33, Mar. 1982, p. 189-201. 12 refs. Contracts No. NAS1-16572; No. NAS1-14472; No. NAS1-15810; Grant No. NCC1-14.

The present investigation is concerned with a fourth order accurate finite difference method and its application to the study of the temporal and spatial stability of the three-dimensional compressible boundary layer flow on a swept wing. This method belongs to the class of compact two-point difference schemes discussed by White (1974) and Keller (1974). The method was apparently first used for solving the two-dimensional boundary layer equations. Attention is given to the governing equations, the solution technique, and the search for eigenvalues. A general purpose subroutine is employed for solving a block tridiagonal system of equations. The computer time can be reduced significantly by exploiting the special structure of two matrices. G.R.

A82-33605 * **Diffraction by a finite strip.** M. H. Williams (Purdue University, West Lafayette, IN). *Quarterly Journal of Mechanics and Applied Mathematics*, vol. 35, Feb. 1982, p. 103-124. 7 refs. Grant No. NsG-3292.

A new approach is presented to diffraction problems involving plane strip barriers or slit apertures. These are problems that display the effects of multiple interacting edges. The approach taken here provides exact, compact solutions. The theory is introduced through a series of examples that are, in fact, the 'standard' problems of the subject, diffraction of a plane oblique wave by a slit, for example. In each case, the solutions are found to depend explicitly on a single 'special' function and its Fourier transform. These fundamental functions are described, with the emphasis placed on practical computational methods. The example problems are all couched in the language of acoustics. C.R.

A82-33625 **Understanding aircraft structures.** J. Cutler. London, Granada Publishing, Ltd., 1981. 176 p. 11 refs. $22.75.

After a brief account of the development history of aircraft structures from wire-braced systems to present semi-monocoque designs, attention is given to the terminology connected with flight, such as the pitch, yaw and roll axes, control, high lift devices, and aircraft shape and dimensions. An account is then given of the nature and calculation of the loads to which aircraft are subjected by maneuvering and payload, and of the most common structural means that have been devised for the bearing of such loads. The design of wing boxes, fuselage tubes, and secondary structures is shown to be a decision process which entails the choosing of sheet, plate, forged or extruded forms of aluminum and titanium alloys, or reinforced plastics. Consideration must then be given to the processes by which the materials chosen will be assembled, along with the means of preventing corrosion of the resulting structure. Additional factors include the detailed design of structural components and fasteners, from the viewpoints of both weight-saving and cost-reduction criteria. Stress calculation methods and flightworthiness requirements are also covered. O.C.

A82-33626 # **Wind tunnel studies of store separation with load factor - Freedrops and captive trajectories.** J. Coste and J. Leynaert (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Jan.-Feb. 1982, p. 1-9.

Similitude conditions are considered for free-fall and captive trajectory store separation studies in wind tunnels, for the general case of in-flight separation with load factor. Three scaling laws, designated light, intermediate and heavy in keeping with test Mach number, were used in the store separation tests. Attention is given to the computer-controlled, six-degree-of-freedom rig which moves the store model incrementally in the aerodynamic field of the parent aircraft, taking into account the aerodynamic forces acting on the store at each point of its trajectory. Special arrangements are used to compensate for the fact that the method is only approximate, in that it does not take into account the relative speeds of store and aircraft. O.C.

A82-33627 # **Model based study of various configurations of jet crossing a cavity - Application to the CEPRA 19 wind tunnel of CEPr.** P. Rebuffet and A. Guédel (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Jan.-Feb. 1982, p. 11-22. 8 refs.

A scale model study is conducted to determine the effects of varying the configuration of the crossing of an anechoic wind tunnel test chamber by a free jet, where the length of the jet and the dimensions of the diffuser inlet are varied. Attention is given to cavity resonances due to aeroacoustic coupling which were observed in some model configurations, as well as background noise measurements and the aerodynamic characteristics of both the jet and the reverse flow within the cavity. A collector compatible with 2-3 m diameter test sections is defined with a view to application to a new wind tunnel test facility. O.C.

A82-33628 # **Potentiality assessment of a parallel structure for the solution of partial differential equations.** J. P. Boisseau, M. Enselme, D. Guiraud, and P. Leca (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Jan.-Feb. 1982, p. 31-41. 9 refs.

An assessment is presented of the efficiency of a parallel-structure minicomputer system consisting of an AP 120 B array processor linked to a 32-bit SEL 32/77 host computer, using software representative of the intended applications: (1) the pseudo-unsteady method, for two- and three-dimensional flow computation; and (2) the pseudo-spectral time method, for the numerical simulation of turbulence. The analysis of test results distinguishes between processing time using the array processor, and transfer time between the memory and the computer unit. A possible compatibility between the hardware and the software algorithm used is investigated in the overlapping of the two characteristic times distinguished. O.C.

A82-33629 # **Skin friction lines.** R. Legendre (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Jan.-Feb. 1982, p. 43, 44.

The conditions of rapid variation for properties of a viscous fluid flowing around a body are discussed, in order to determine whether the hypothesis of continuity is always justified either alone or in combination with Lighthill's (1963) additional hypothesis. The method employed uses singular points and lines which either pass through, originate or terminate at them. O.C.

A82-33630 # **A new method for constructing two-dimensional orthogonal and non-orthogonal meshes.** H. Viviand (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale* (English Edition), Jan.-Feb. 1982, p. 45-49.

A novel and simple method is described for the construction of arbitrary domain orthogonal or nonorthogonal two-dimensional meshes, in which the integration of an ordinary differential equation directly yields mesh point Cartesian coordinates. Nozzle and airfoil profile flow examples are considered. O.C.

A82-33646 **Aviation electronics /4th edition/.** K. W. Bose. Indianapolis, IN, Howard W. Sams and Co., Inc., 1981. 396 p. $17.

Standard communication, navigation, and air traffic control systems are considered along with the aviation radio spectrum, and aircraft communication systems, taking into account rules for flight operations, the structure of the airways, terminal facilities, en-route facilities, aspects of collision avoidance, radio waves and their effect at aviation frequencies, very-low frequencies, the low and medium aviation frequencies, the HF aviation bands, the VHF aviation bands, the UHF bands, aircraft antenna requirements, cockpit audio requirements, microphones and headsets, and transceivers. Other topics discussed are related to the VHF omnirange, navigation systems, instrument landing systems, automatic direction finders, distance-measuring equipment, radar beacon transponders, and weather radar. Attention is also given to gyroscopes and servo systems, flight directors and flight simulators, autopilots, design and reliability of solid-state avionic systems, shop facilities and regulations, and aircraft installations. G.R.

A82-33648 **Essentials of aviation management /2nd edition/.** J. D. Richardson (Appalachian State University, Boone, NC). Dubuque, IA, Kendall-/Hunt Publishing Co., 1981. 589 p. 211 refs. $10.95.

This book is intended to focus on the management of aviation businesses and to provide assistance to managers as they strive to overcome the problems of a rapidly changing and complex business environment. The contents of this book represent a mixture of generally accepted business procedures, practical 'how-to-do-it' material, applied research findings, sophisticated 'tools' and techniques as well as accepted history. A brief review is provided of aviation history and its impact upon the modern manager. Attention is given to management functions, profit orientation, business organization, regulatory impact, manpower management, physical facilities, operational activities, flight operations, aviation maintenance, marketing, problem administration, information systems, aspects of decision making, and the future for aviation business. G.R.

A82-33650 **Gas turbine aero-thermodynamics with special reference to aircraft propulsion.** F. Whittle. Oxford, Pergamon Press, 1981. 273 p. $17.50.

The fundamental principles and developments in aerothermodynamic theory and applications in aircraft propulsion gas turbine systems are detailed. Specific attention is given to the concepts of entropy and the isentropic expansion of a perfect gas. An analysis of the flux density and radial equilibrium in whirling isentropic compressible flows are presented, along with techniques for modeling shock waves in air, isentropic flow through nozzles, and the thermal cycles of perfect gases. Approximate methods for calculating gas turbine cycles are explored, as are the mass flow rate in gas turbines, the part load performance of gas generators, and combustion. Consideration is also given to turbojets, calculations of maximum efficiency, thrust boosting, turbofans, the effect of height and speed on performance, and to a numerical model of a super-thrust engine. M.S.K.

A82-33657 * **Airborne lidar measurements of the Soufriere eruption of 17 April 1979.** W. H. Fuller, Jr., S. Sokol (NASA, Langley Research Center, Hampton, VA), and W. H. Hunt (Wyle Laboratories, Hampton, VA). *Science*, vol. 216, June 4, 1982, p. 1113-1115. 6 refs.

At the time of the Soufriere, St. Vincent, volcanic eruption of April 17, 1979, a NASA P-3 aircraft with an uplooking lidar (light detection and ranging) system onboard was airborne 130 kilometers east of the island. Lidar measurements of the fresh volcanic ash were made approximately 2 hours after the eruption, 120 kilometers to the northeast and east. On the evening of April 18, the airborne lidar, on a southerly flight track, detected significant amounts of stratospheric material in layers at 16, 17, 18, and 19.5 kilometers. These data, and measurements to the north on April 19, indicate that the volcanic plume penetrated the stratosphere to an altitude of about 20 kilometers and moved south during the first 48 hours after the eruption. (Author)

A82-33671 **Aerodynamics: The science of air in motion /2nd edition/.** J. E. Allen (British Aerospace Public, Ltd., Co., Kingston-upon-Thames, Surrey, England). New York, McGraw-Hill Boon Co.; London, Granada Publishing, Ltd., 1982. 212 p. 48 refs. $25.

An anthology of aerodynamic concepts, theory, models of natural phenomena, and applications is presented. The development of aerodynamics visualizations and theory is traced from Newton's work on air resistance in 1726 to space flight and MHD modelling. The behavior of air in motion is examined, with consideration to various aspects of boundary layers, circulation, vortex flow, vorticity, and eddies. Main concepts employed in aerodynamic theory and experiments are listed, including physical constants and aerodynamic quantities such as the Reynolds number, Prandtl number, etc. Attention is given to natural phenomena such as wind flows, tornados, convective motion, and other meteorological occurrences, and the effects of terrain on the movements of the atmosphere. The extension of aerodynamic principles to the design of wind turbines and to aeronautics is explored and carried on to describe celestial objects and their behavior. M.S.K.

A82-33701 **Biennial Wind Energy Conference and Workshop, 5th, Washington, DC, October 5-7, 1981, Proceedings.** *ASME, Transactions, Journal of Solar Energy Engineering*, vol. 104, May 1982. 74 p. (For individual items see A82-33702 to A82-33712)

The results of studies funded by the Federal government to advance the state on manned flight simulators was developed and demonstrated using flight simulator facilities at NASA Ames. A piecewise linear state variable technique is used. This technique provides the system accuracy, stability and transient response required for integrated aircraft and propulsion control system studies. The real time dynamic model includes the detail and flexibility required for the evaluation of critical control parameters and propulsion component limits over a limited flight envelope. The model contains approximately 7.0 K bytes of in-line computational code and 14.7 K of block data. It has an 8.9 ms cycle time on a Xerox Sigma 9 computer. A Pegasus-Harrier propulsion system was used as a baseline for developing the mathematical modeling and simulation technique. A hydromechanical and water injection control system was also simulated. The model was programmed for interfacing with a Harrier aircraft simulation at NASA Ames. Descriptions of the real time methodology and model capabilities are presented. Author

N82-24202*# Garrett Turbine Engine Co., Phoenix, Ariz.

STUDY OF ADVANCED PROPULSION SYSTEMS FOR SMALL TRANSPORT AIRCRAFT TECHNOLOGY (STAT) PROGRAM Final Report

C. F. Baerst, R. W. Heldenbrand, and J. H. Rowse Mar. 1981 119 p refs

(Contract NAS3-21997)

(NASA-CR-165610; NAS 1.26:165610; Garrett-21-3911) Avail: NTIS HC A06/MF A01 CSCL 21E

Definitions of takeoff gross weight, performance, and direct operating cost for both a 30 and 50 passenger airplane were established. The results indicate that a potential direct operating cost benefit, resulting from advanced technologies, of approximately 20 percent would be achieved for the 1990 engines. Of the numerous design features that were evaluated, only maintenance-related items contributed to a significant decrease in direct operating cost. Recommendations are made to continue research and technology programs for advanced component and engine develoment. T.M.

N82-24203*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FUTURE PROPULSION OPPORTUNITIES FOR COMMUTER AIRPLANES

William C. Strack Washington 1982 24 p refs Presented at the Commuter Airlines Meeting, Savannah, 24-26 May 1982; sponsored by the Society of Automotive Engineers

(NASA-TM-82880; E-1256; NAS 1.15:82880) Avail: NTIS HC A02/MF A01 CSCL 21E

Commuter airplane propulsion opportunities are summarized. Consideration is given to advanced technology conventional turboprop engines, advanced propellers, and several unconventional alternatives: regenerative turboprops, rotaries, and diesels. Advanced versions of conventional turboprops (including propellers) offer 15-20 percent savings in fuel and 10-15 percent in DOC compared to the new crop of 1500-2000 SHP engines currently in development. Unconventional engines could boost the fuel savings to 30-40 percent. The conclusion is that several important opportunities exist and, therefore, powerplant technology need not plateau. Author

N82-24204# Solar Turbines International, San Diego, Calif.

EVALUATION OF CAST TITANIUM ALLOY COMPRESSOR COMPONENTS, VOLUME 1 Final Report, May 1976 - Aug. 1978

Alvin N. Hammer St. Louis, Mo. Army Aviation Research and Development Command Nov. 1981 84 p 2 Vol.

(Contract DAAG46-76-C-0042)

(AD-A111431; RDR-1827-18-Vol-1;
USAAVRADCOM-TR-80-F-10-VOL-1;
AMMRC-TR-81-56-VOL-1) Avail: NTIS HC A05/MF A01 CSCL 21/5

The objective of this program was to characterize the properties of cast titanium alloy compressor impellers to provide a background for design, processing, and qualification for service in the Solar T62T-40 Titan auxiliary power unit and similar small radial gas turbine engines. Four titanium alloy investment casting foundries participated in the production of straight vane test wheels, a low-cost representation of the compressor impellers. As-cast and hot isostatic pressed (HIPed) Ti-6Al-4V was seen to have less than half the high cycle fatigue strength (20 to 30 ksi versus 60 ksi) of equivalent sections from forged and machined impellers. A modified solution heat treatment and aging cycle was developed which restored the fatigue strength to approximately 50 ksi, and which provided adequate tensile strength and ductility. High cycle fatigue strength of weld repaired vanes was significantly lower than that of unwelded, however. Cast and machined wheels offer substantial cost savings over wheels conventionally machined from forgings. These savings may be as much as 50%, or about $900 per wheel. Author (GRA)

N82-24205* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

HYDRAULIC ACTUATOR MECHANISM TO CONTROL AIRCRAFT SPOILER MOVEMENTS THROUGH DUAL INPUT COMMANDS Patent

Stephen C. Irick, inventor (to NASA) Issued 9 Jun. 1981 5 p Filed 17 Aug. 1979 Supersedes N80-11065 (18 - 02, p 0148)

(NASA-Case-LAR-12412-1; US-Patent-4,272,046;
US-Patent-Appl-SN-067595; US-Patent-Class-244-226;
US-Patent-Class-244-78; US-Patent-Class-244,213;
US-Patent-Class-74-480R; US-Patent-Class-74-479) Avail: US Patent and Trademark Office CSCL 01C

An aircraft flight spoiler control mechanism is described. The invention enables the conventional, primary spoiler control system to retain its operational characteristics while accommodating a secondary input controlled by a conventional computer system to supplement the settings made by the primary input. This is achieved by interposing springs between the primary input and the spoiler control unit. The springs are selected to have a stiffness intermediate to the greater force applied by the primary control linkage and the lesser resistance offered by the spoiler control unit. Thus, operation of the primary input causes the control unit to yield before the springs, yet, operation of the secondary input, acting directly on the control unit, causes the springs to yield and absorb adjustments before they are transmitted into the primary control system.

Official Gazette of the U.S. Patent and Trademark Office

N82-24206*# Minnesota Univ., Minneapolis. Inst. of Technology.

EIGENSPACE TECHNIQUES FOR ACTIVE FLUTTER SUPPRESSION Semiannual Progress Report, 1 Oct. 1981 31 Mar. 1982

W. L. Garrard 31 Mar. 1982 116 p refs

(Grant NAG1-217)

(NASA-CR-168931; NAS 1.26:168931) Avail: NTIS HC A06/MF A0 CSCL 01C

Mathematical models to be used in the control system design were developed. A computer program, which takes aerodynamic and structural data for the ARW-2 aircraft and converts these data into state space models suitable for use in modern control synthesis procedures, was developed. Reduced order models of inboard and outboard control surface actuator dynamics and a second order vertical wind gust model were developed. An analysis of the rigid body motion of the ARW-2 was conducted. The deletion of the aerodynamic lag states in the rigid body modes resulted in more accurate values for the eigenvalues associated with the plunge and pitch modes than were obtainable if the lag states were retained. Author

N82-24208*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PREDICTION OF AIRCRAFT HANDLING QUALITIES USING ANALYTICAL MODELS OF THE HUMAN PILOT

Ronald A. Hess Apr. 1982 11 p refs

(NASA-TM-84233; A-8884; NAS 1.15:84233) Avail: NTIS HC A02/MF A01 CSCL 01C

The optimal control model (OCM) of the human pilot is applied to the study of aircraft handling qualities. Attention is focused primarily on longitudinal tasks. The modeling technique differs from previous applications of the OCM in that considerable effort is expended in simplifying the pilot/vehicle analysis. After briefly reviewing the OCM, a technique for modeling the pilot controlling higher order systems is introduced. Following this, a simple criterion for determining the susceptibility of an aircraft to pilot induced oscillations is formulated. Finally, a model based metric for pilot rating prediction is discussed. The resulting modeling procedure provides a relatively simple, yet unified approach to the study of a variety of handling qualities problems. R.J.F.

N82-24209*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

APPLICATION OF MODAL CONTROL TO WING-FLUTTER SUPPRESSION
Aaron J. Ostroff and Samuel Pines (Analytical Mechanics Associates, Inc., Jericho, N.Y.) May 1982 73 p refs
(NASA-TP-1983; L-14976; NAS 1.60:1983) Avail: NTIS HC A04/MF A01 CSCL 01C

A discrete modal control design approach that is applied to a single control surface, unswept aircraft wing subject to bending torsion flutter is described. The model approach is a mathematical method to decouple the equations of motion into isolated differential equations. In this paper, a pole-placement approach is then applied to determine stability gains in the discrete plane using only the two complex-conjugate flutter-mode equations. A fixed gain Kalman filter is used to estimate the model amplitudes using three measurements. Results are presented for a full-state estimator (36 states) and two reduced state estimators using two different closed-loop pole locations. The control law is designed for a dynamic pressure that is 50 percent greater than the uncontrolled-flutter dynamic pressure. With constant control-law gains, the closed-loop system remains stable over the dynamic-pressure range from flutter onset to approximately an 80-percent increase in pressure. M.D.K.

N82-24210# Royal Aircraft Establishment, Farnborough (England).
THE DETERMINATION OF CRITICAL FLUTTER CONDITIONS OF NONLINEAR SYSTEMS
D. L. Woodcock Mar. 1981 26 p refs
(RAE-TM-Struct-986; BR80499) Avail: NTIS HC A03/MF A01

Direct determination of limit cycles of the periodic motion of aeroelastic systems in transonic flow is discussed. A method of imposed disturbances, based on energy balance methods, is proposed. The Lagrange equation of motion is approximated by a nonlinear matrix differential equation into which a nondimensional time, omega t, is introduced. Omega is the frequency of the periodic motion. The frequency parameter based on omega, the airspeed, V, and a reference length is upsilon. The relationship between the amplitude of steady state oscillations and V, and whether these oscillations are stable, are determined. Any one of the unknowns, e.g., upsilon, can be used to find the others. Author (ESA)

N82-24211# European Space Agency, Paris (France).
A METHOD FOR DETERMINING THE AEROELASTIC BEHAVIOR OF AIRCRAFT WITH ACTIVE CONTROL SYSTEMS Ph.D. Thesis - Tech. Univ. Carolo-Wilhelmina, West Germany
Raymond Freymann Feb. 1982 129 p refs Transl. into ENGLISH from "Ueber das aeroelastische Verhalten von Flugzeugen mit aktiven Servo-Kontrollsystemen", Rept. DFVLR-FB-81-05 DFVLR, Goettingen, West Germany, Feb. 1981 Original report in GERMAN previously announced as N82-10047
(ESA-TT-719; DFVLR-FB-81-05) Avail: NTIS HC A07/MF A01; original report in GERMAN available at DFVLR Cologne DM 26.30

An analytical method for performing dynamic calculations on servocontrolled aircraft, based on an extended formulation of the generalized aeroelastic equations, is presented. The additional parameters introduces in the extended equations of motion are determined experimentally in a ground vibration test performed on a real aircraft structure as well as with help from an experimental-analytical method for determining the transfer functions of the hydraulic actuators. The elaborated method is shown to be satisfactory by comparison of measured and calculated data resulting from investigations performed on a model wing structure with a rudder driven by a hydraulic actuator. Author (ESA)

N82-24212* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ENVIRONMENTAL FOG/RAIN VISUAL DISPLAY SYSTEM FOR AIRCRAFT SIMULATORS Patent
Wendell D. Chase, inventor (to NASA) Issued 2 Feb. 1982 28 p Filed 29 Jun. 1979 Supersedes N79-33220 (17 - 24, p 3180)
(NASA-Case-ARC-11158-1; US-Patent-4,313,726; US-Patent-Appl-SN-053566; US-Patent-Class-434-42; US-Patent-Class-434-43) Avail: US Patent and Trademark Office CSCL 14B

An environmental fog/rain visual display system for aircraft simulators is described. The electronic elements of the system include a real time digital computer, a caligraphic color display which simulates landing lights of selective intensity, and a color television camera for producing a moving color display of the airport runway as depicted on a model terrain board. The mechanical simulation elements of the system include an environmental chamber which can produce natural fog, nonhomogeneous fog, rain and fog combined, or rain only. A pilot looking through the aircraft wind screen will look through the fog and/or rain generated in the environmental chamber onto a viewing screen with the simulated color image of the airport runway thereon, and observe a very real simulation of actual conditions of a runway as it would appear through actual fog and/or rain. Official Gazette of the U.S. Patent and Trademark Office

N82-24213*# National Aeronautics and Space Administration, Washington, D. C.
WIND TUNNELS OF THE INSTITUTE OF MECHANICS OF MOSCOW STATE UNIVERSITY
S. M. Gorlin, ed. and G. E. Khudyakov, ed. Apr. 1982 150 p refs Transl. into ENGLISH of 'Aerodinamicheskiye Truby Instituta Mekhaniki" Moscow, 1971 p 1-100 Transl. by Franklin Book Programs, Inc., Cairo, Egypt. Original doc. prep. by Inst. of Mechanics, Moscow State Univ.
(Contract NSF-C-724)
(NASA-TM-76909; NAS 1.15:76909; TT-78-58009) Avail: NTIS HC A07/MF A01 CSCL 14B

The construction and characteristics of subsonic wind tunnels are described. Methods are presented, on which are based the experimental works conducted on these installations. The data logs of the treatment of the results of experiments are also given. Author

N82-24214*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ADAPTIVE-WALL WIND-TUNNEL RESEARCH AT NASA-AMES RESEARCH CENTER
Edward T. Schairer and Joel P. Mendoza May 1982 16 p refs
(NASA-TM-84236; A-8893; NAS 1.15:84236) Avail: NTIS HC A02/MF A01 CSCL 14B

Adaptive wall wind tunnel research is summarized. Small scale two and three dimensional wind tunnel experiments and numerical experiments with a three dimensional adaptive wall simulator are included. A NACA 0012 airfoil was tested in a 25 by 13 cm slotted wall test section. Airflow through the test section walls was controlled by adjusting the pressures in segmented plenums. Interference free conditions were successfully attained in subsonic and transonic flows. For the three dimensional experiment, the 25 by 13 cm wind tunnel was modified to permit cross stream wall adjustments. The test model was a semispan wing mounted to one sidewall. Wall interference was substantially reduced at several angles of attack at Mach 0.60. A wing on wall configuration was also modeled in the numerical experiments. These flow simulations showed that free air conditions can be approximated by adjusting boundary conditions at only the floor and ceiling of the test section. No sidewall control was necessary. Typical results from these experiments are discussed. Author

N82-24301*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STANDARD TESTS FOR TOUGHENED RESIN COMPOSITES
May 1982 29 p refs
(NASA-RP-1092; L-15317; NAS 1.61:1092) Avail: NTIS HC A03/MF A01 CSCL 11D

Several toughened resin systems are evaluated to achieve commonality for certain kinds of tests used to characterize toughened resin composites. Specifications for five tests were standardized; these test standards are described. S.L.

N82-24328*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A STATUS REVIEW OF NASA'S COSAM (CONSERVATION OF STRATEGIC AEROSPACE MATERIALS) PROGRAM Executive Status Report
Joseph R. Stephens Washington May 1982 46 p refs
(NASA-TM-82852; E-1222; NAS 1.15:82852) Avail: NTIS HC A03/MF A01 CSCL 11F

The use and supply of strategic elements in nickel base superalloys for gas turbine engines are reviewed. Substitution of failure flights. System was found to provide desirable flying qualities upon reconfiguration. Author (GRA)

N82-25265# National Aerospace Lab., Amsterdam (Netherlands). Flight Div.

ROLL RESPONSE CRITERIA FOR TRANSPORT AIRCRAFT WITH ADVANCED FLIGHT CONTROL SYSTEMS IN THE LANDING APPROACH AND TOUCHDOWN

M. F. C. vanGool 26 Oct. 1980 134 p refs
(Contracts NIVR-1745; RB-RLD/78017; RB-RLD/78017/1; RB-RLD/79036)
(NLR-TR-80103-U) Avail: NTIS HC A07/MF A01

Approach and landing of an aircraft equipped with a roll-rate-command/bank-angle-hold flight control system were investigated, using a moving base simulator. Pilot comments and ratings following systematic variation of roll mode time constant, maximum available roll rate, and pure time delay were noted. Results indicate that roll response criteria are too lenient. The more precise control of bank angle, available with the flight control system, leads to a higher internal standard of the pilot for his judgement of roll response quality. These control systems must comply with more strict requirements than conventional systems to obtain the same degree of pilot approval. Based on the experiments, limits/boundaries in existing criteria are redefined and criteria are proposed. Author (ESA)

N82-25266*# Boeing Military Airplane Development, Wichita, Kans.

CONCEPTUAL DESIGN STUDY FOR AN ADVANCED CAB AND VISUAL SYSTEM, VOLUME 1 Final Report

R. J. Rue, M. L. Cyrus, T. A. Garnett, J. W. Nachbor, J. A. Seery, and R. L. Starr Jul. 1980 116 p refs Sponsored in part by the Dept. of the Army 2 Vol.
(Contract NAS2-10464)
(NASA-CR-166235; NAS 1.26:166235) Avail: NTIS HC A06/MF A01 CSCL 14B

A conceptual design study was conducted to define requirements for an advanced cab and visual system. The rotorcraft system integration simulator is for engineering studies in the area of mission associated vehicle handling qualities. Principally a technology survey and assessment of existing and proposed simulator visual display systems, image generation systems, modular cab designs, and simulator control station designs were performed and are discussed. State of the art survey data were used to synthesize a set of preliminary visual display system concepts of which five candidate display configurations were selected for further evaluation. Basic display concepts incorporated in these configurations included: real image projection, using either periscopes, fiber optic bundles, or scanned laser optics; and virtual imaging with helmet mounted displays. These display concepts were integrated in the study with a simulator cab concept employing a modular base for aircraft controls, crew seating, and instrumentation (or other) displays. A simple concept to induce vibration in the various modules was developed and is described. Results of evaluations and trade offs related to the candidate system concepts are given, along with a suggested weighting scheme for numerically comparing visual system performance characteristics. S.L.

N82-25267*# Boeing Military Airplane Development, Wichita, Kans.

CONCEPTUAL DESIGN STUDY FOR AN ADVANCED CAB AND VISUAL SYSTEM, VOLUME 2 Final Report

R. J. Rue, M. L. Cyrus, T. A. Garnett, J. W. Nachbor, J. A. Seery, and R. L. Starr Jul. 1980 171 p refs Sponsored in part by the Dept. of the Army 2 Vol.
(Contract NAS2-10464)
(NASA-CR-166236; NAS 1.26:166236) Avail: NTIS HC A08/MF A01 CSCL 14B

The performance, design, construction and testing requirements are defined for developing an advanced cab and visual system. The rotorcraft system integration simulator is composed of the advanced cab and visual system and the rotorcraft system motion generator, and is part of an existing simulation facility. User's applications for the simulator include rotorcraft design development, product improvement, threat assessment, and accident investigation. S.L.

N82-25270# Air Force Human Resources Lab., Brooks AFB, Tex. Operations Training Div.

SIMULATOR FOR AIR-TO-AIR COMBAT VERSUS REAL WORLD: VISUAL CUE ANALYSIS FOR SIMULATED AIR-TO-AIR COMBAT TRAINING Final Report

Robert E. Coward and Alexander M. Rupp Jan. 1982 26 p refs
(AF Proj. 1123)
(AD-A110570; AFHRL-TR-81-26) Avail: NTIS HC A03/MF A01 CSCL 05/9

Flying an aircraft requires a continuous interpretation of the visual environment in which the pilot uses visual information from outside the cockpit and from the flight instruments inside the cockpit to develop and maintain an awareness of the status of the aircraft and its location in space. Flying a high-speed/high-performance aircraft in an air-to-air combat environment vastly increases the complexity of the pilot's task. The pilot must also keep track of and evaluate the performance of any opposing aircraft. To maintain a dynamic awareness of the situation and ultimately to be successful in the airborne arena, the pilot depends heavily on interpretation of out-of-the-cockpit visual cues. Usually training of the necessary visual skills for air-to-air combat takes place entirely in the aircraft - a high stress environment where the student pilot quickly can become overwhelmed with visual information. In addition, the training is severely limited by both rules of engagement and aircraft safety limitations that prevent the student pilot from experiencing and practicing maximum performance tactics. GRA

N82-25271# Committee on Science and Technology (U. S. House).

THE FIRST A IN NASA

Washington GPO 1982 194 p Hearings before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 97th Congr., 1st Sess., No. 61, 8 Dec. 1981
(GPO-89-476) Avail: Subcommittee on Transportation, Aviation and Materials

The contributions of NACA/NASA to both civil and military aviation are reviewed and the current relations of NASA with the aircraft industry and academia are examined in the light of proposed cuts in the aeronautics technology research portion of the agency's budget. The impact of the closing of the Lewis Research Center on the development of military aircraft is considered. A.R.H.

N82-25334# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Drehfluegler.

CALCULATION OF THE CROSS SECTION PROPERTIES AND THE SHEAR STRESSES OF COMPOSITE ROTOR BLADES

Rudolf Woerndle 8 Sep. 1981 32 p refs Presented at 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DGLR
(MBB-UD-334-81-O) Avail: NTIS HC A03/MF A01

Shear stress distribution and shear stiffness of transversely loaded cylindrical beams of any cross sectional shape are determined, using the finite element method. Warp, resulting from transverse load, is calculated with special two dimensional elements. If the warping of any cross section is known, shear stress distribution, shear stiffness, and shear center can be found. These values are obtained for any cross section through two dimensional analysis and, therefore, the whole structure must be considered. Stress distribution calculation results for complicated cross secions, i.e., for material that is homogeneous or inhomogeneous, isotropic or orthotropic, are shown. Because only small amounts of computational effort are necessary, the method is appropriate to the early design state. However, the validity of the theory is limited to small conus angles. Author (ESA)

N82-25383# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Betriebsbereich.

MECHANICAL PROPERTIES OF HOT ISOSTATIC PRESSED P/M-TITANIUM FOR HELICOPTER COMPONENTS

Wolfgang Keinath and Marko Tapavicza 1981 31 p refs Presented at 7th European Rotorcraft and Powered Lift Aircraft Forum, Garmisch-Partenkirchen, West Germany, 8-11 Sep. 1981; sponsored by DGLR
(MBB-UD-324-81-O) Avail: NTIS HC A03/MF A01

The production of titanium alloy (Ti6Al4V) aircraft components was investigated. Powder metallurgy (P/M) manufacturing processes that involve hot isostatic pressing (HIP) and investment casting were characterized. The microstructure of P/M HIP Ti6Al4V bar and plate specimens is depicted. Mechanical properties were determined by static tensile and fatigue testing and a modified Goodman diagram was derived. Mechanical properties are the same as those of the corresponding wrought alloy. Static and dynamic values for a P/M HIP TiGAl4V blade fitting were also found from results of helicopter rotor hub component tests. Analysis shows that the blade fitting fulfills strength requirements. Reduction in machining as well as raw material weight savings when manufacturing P/M HIP components are pointed out. Author (ESA)

N82-25399# General Technology Applications, Inc., Arlington, Va.

INVESTIGATION OF THE APPLICATION OF A CRYOGENIC BLENDING PROCESS TO PRODUCE ANTIMISTING DIESEL FUELS Final Report

Albert F. Hadermann, Paul Waters, Jerry C. Trippe, and William Weitzen 15 Jan. 1982 65 p refs
(Contract DAAK70-81-C-0134)
(AD-A110917; GTA-A-001) Avail: NTIS HC A04/MF A01 CSCL 21/4

Fire-resistant fuels have been investigated by the United States Army as a means of reducing the risk of fire in land combat vehicles and certain aircraft. One approach has been the use of high-molecular-weight polymer additives for suppression of mist formations. The polymers which are effective in mist suppression are very difficult to dissolve in fuel. A newly discovered process for dissolving high-molecular-weight polymers is investigated to determine its applicability to the preparation of mist suppression fuels. The conclusions area that certain high-molecular-weight polymers which show strong mist suppression behavior can be dissolved rapidly in diesel fuel and that the new dissolving process appears to be adaptable to field use. Author (GRA)

N82-25402# Naval Research Lab., Washington, D. C.

EVALUATION OF THREE PERCENT AQUEOUS FILM FORMING FOAM (AFFF) CONCENTRATES AS FIRE FIGHTING AGENTS Final Report, Sep. 1978 - Nov. 1980

Edwin J. Jablonski Tyndall AFB, Fla. Air Force Engineering and Services Center. Apr. 1981 45 p refs
(AF Proj. 2505)
(AD-A110821; AFESC/ESL-TR-81-18) Avail: NTIS HC A03/MF A01 CSCL 13/12

A large-scale fire test program involving 20,000-square foot JP-4 fuel fires was conducted to evaluate the fire suppression effectiveness and compatibility of 3 percent Aqueous Film Forming Foam (AFFF) agents in Air Force fire fighting vehicles. Three commercially available 3 percent AFFF concentrates were tested in accordance with military specification MIL-F-24385B. Test results are summarized in Appendix A. As a result of these tests, an updated Revision C to this MIL SPEC has been accomplished with new requirements for both 3 percent and 6 percent AFFF extinguishing agents. Author (GRA)

N82-25404# Lockheed Missiles and Space Co., Palo Alto, Calif.

PANEL OPTIMIZATION WITH INTEGRATED SOFTWARE (POIS). VOLUME 1: PANDA: INTERACTIVE PROGRAM FOR PRELIMINARY MINIMUM WEIGHT DESIGN Final Report, Jun. 1976 - Oct. 1980

David Bushnell Wright-Patterson AFB, Ohio AFWAL Jul. 1981 262 p refs
(Contract F33615-76-C-3105; AF Proj. 2307)
(AD-A110963; AFWAL-TR-81-3073-Vol-1) Avail: NTIS HC A12/MF A01 CSCL 01/3

An analysis and an interactive computer program are described through which minimum weight designs of composite, stiffened, cylindrical panels can be obtained subject to general and local buckling constraints and stress and strain constraints. The panels are subjected to arbitrary combinations of in-plane axial, circumferential, and shear resultants. Nonlinear material effects are included if the material is isotropic or has stiffness in only one direction (as does a discrete or a smeared stiffener). Several types of general and local buckling modes are included as constraints in the optimization process, including general instability, panel instability with either stringers or rings smeared out, local skin buckling, local crippling of stiffener segments, and general, panel, and local skin buckling including the effects of stiffener rolling. Certain stiffener rolling modes in which the panel skin does not deform but the cross section of the stiffener does deform are also accounted for. The interactive PANDA system consists of three independently executed modules that share the same data base. In the first module an initial design concept with rough (not necessarily feasible or accurate) dimensions are provided by the user in a conversational mode. In the second module the user decides which of the design parameters of the concept are to be treated by PANDA as decision variables in the optimization phase. In the third module the optimization calculations are carried out. Many examples are provided in which optimum designs obtained by PANDA are compared to those in the literature. Author (GRA)

N82-25424# Rome Air Development Center, Griffiss AFB, N.Y. Strategic Surveillance Branch.

RADAR FREQUENCY RADIATION Progress Report, Feb. 1978 - Sep. 1981

Edward Malowicki Nov. 1981 183 p ref
(AF Proj. 2059)
(AD-A111852; RADC-TR-81-347) Avail: NTIS HC A09/MF A01 CSCL 17/9

A method is presented for the determination of radar frequency radiation power densities that the PAVE PAWS radar system could produce in its air and ground environment. The effort was prompted by the concern of the people in the vicinity of OTIS AFB MA and BEALE AFB CA about the possible radar frequency radiation hazard of the PAVE PAWS radar. The method is based on the following main assumptions that: (a) the total field can be computed as the vector summation of the individual fields due to each antenna element; (b) the individual field can be calculated using distances for which the field point is in the far field of the antenna element. An RFR computer program was coded for the RADC HE 6180 digital computer and exercised to calculate the radiation levels in the air and ground space for the present baseline and the possible Six DB and 10 DB growth systems of the PAVE PAWS radar system at OTIS AFB MA. The average radiation levels due to the surveillance fence were computed for three regions: in the air space in front of the radar, at the radar hazard fence at OTIS AFB MA and at representative ground points in the OTIS AFB vicinity. It was concluded that the radar frequency radiation of PAVE PAWS does not present a hazard to personnel provided there is no entry to the air hazard zone or to the area within the hazard fence. The method developed offers a cost effective way to determine radiation levels from a phased array radar especially in the near field and transition regions. GRA

N82-25435# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A CASE STUDY OF RELIABILITY AND MAINTAINABILITY OF THE F-16 APG-66 FIRE CONTROL RADAR M.S. Thesis

Daniel DeMarchi Sep. 1981 115 p refs
(AD-A111387; AFIT-LSSR-99-81) Avail: NTIS HC A06/MF A01 CSCL 17/9

During the development and test phase of weapon system acquisition, program management and design emphasis must be directed to producing a system that achieves reliability and maintainability in the field. Investigated were these development and test efforts and test efforts and the demonstrated operational performance of a major weapon subsystem in the form of a case study analysis of the F-16 fire control radar. Comparisons of predicted, test-demonstrated and operational APG-66 reliability and maintainability parameters constitute the significant portion of the analyses. In addition, the reliability and maintainability programs and selected performance indicators of the APG-66 and APQ-120 are compared in order to examine the results of differing test-program acquisition policies. This thesis effort determined that the APG-66 has not yet attained a constant failure rate indicative of an equipment's useful life. The research also determined that increased efforts in the test function of an acquisition produces significant benefits in operational results. A summary analysis of the entire program found the predictions based upon the critical design review and intermediate level maintainability demonstration to be somewhat optimistic. GRA

N82-25488# Perkin-Elmer Corp., Pomona, Calif. Aerospace Div.

TECHNIQUES SUITABLE FOR A PORTABLE WEAR METAL ANALYZER Final Report, Oct. 1980 - Apr. 1981

William H. Niu, Eric B. Andersen, and Gordon J. Fergusson Wright-Patterson AFB, Ohio AFWAL Sep. 1981 89 p refs
(Contract F33615-80-C-2037; AF Proj. 3048)
(AD-A111352; AFWAL-TR-81-2076) Avail: NTIS HC A05/MF A01 CSCL 20/8

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Panel Optimization with Integrated Software
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Biennial Wind Energy Conference and Workshop, 5th,
Washington, DC, October 5-7, 1981, Proceedings
A82-33701
Formability of metallic materials - 2000 A.D.;
Proceedings of the Symposium, Chicago, IL, June
24, 25, 1980
A82-33989
International aerospace review; Proceedings of the
First International Aerospace Symposium, Le
Bourget, Seine-Saint-Denis, France, June 2, 3,
1981
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of the art of wind energy conversion systems (WECS) construction, operation, applications, and financial viability are presented. The economics of WECS were considered in terms of applicable tax laws, computer simulations of net value of WECS to utilities, and the installation of Mod-2 2.5 MW and WTS-4 4MW wind turbines near Medicine Bow, WY to test the operation of two different large WECS on the same utility grid. Potential problems of increasing penetration of WECS-produced electricity on a utility grid were explored and remedies suggested. The structural dynamics of wind turbines were analyzed, along with means to predict potential noise pollution from large WECS, and to make blade fatigue life assessments. Finally, Darrieus rotor aerodynamics were investigated, as were dynamic stall in small WECS and lightning protection for wind turbines and components. M.S.K.

A82-33707 # Effects of dynamic stall on SWECS. R. B. Noll (Aerospace Systems, Inc., Burlington, MA) and N. D. Ham (MIT, Cambridge, MA). *(Biennial Wind Energy Conference and Workshop, 5th, Washington, DC, Oct. 5-7, 1981.) ASME, Transactions, Journal of Solar Energy Engineering,* vol. 104, May 1982, p. 96-101. 12 refs.

A study of dynamic stall is presented in order to define its influence on the airfoil force and moment coefficients so that these effects can be included in the calculation of small wind energy conversion system (SWECS) loads and responses. A review of past work indicates that semiempirical methods are best suited to SWECS requirements. A definition of a dynamic stall theory is made for use in SWECS design, and the theory is implemented in SWECS loads and dynamic response analyses. Sample calculations are made for a representative vertical-axis machine. It is shown that loads and moments on the blades may be underestimated if dynamic stall is not considered. (Author)

A82-33708 # Darrieus rotor aerodynamics. P. C. Klimas (Sandia National Laboratory, Albuquerque, NM). *(Biennial Wind Energy Conference and Workshop, 5th, Washington, DC, Oct. 5-7, 1981.) ASME, Transactions, Journal of Solar Energy Engineering,* vol. 104, May 1982, p. 102-105. 19 refs. Contract No. DE-AC04-76DP-00789.

A summary of the progress of modeling the aerodynamic effects on the blades of a Darrieus wind turbine is presented. Interference is discussed in terms of blade/blade wake interaction and improvements in single and multiple stream tube models, of vortex simulations of blades and their wakes, and a hybrid momentum/vortex code to combine fast computation time with interference-describing capabilities. An empirical model has been developed for treating the properties of dynamic stall such as airfoil geometry, Reynolds number, reduced frequency, angle-of-attack, and Mach number. Pitching circulation has been subjected to simulation as potential flow about a two-dimensional flat plate, along with applications of the concepts of virtual camber and virtual incidence, with a cambered airfoil operating in a rectilinear flowfield. Finally, a need to develop a loading model suitable for nonsymmetrical blade sections is indicated, as well as blade behavior in a dynamic, curvilinear regime. M.S.K.

A82-33750 The TM 333, a trump card for Turbomeca (Le TM 333, atout majeur de Turbomeca). J. Morisset. *Air et Cosmos,* vol. 20, May 8, 1982, p. 13, 15-17. In French.

The new dual turbine, digital control TM 333 helicopter motor is described as having benefitted from a ten year program in basic aerodynamics, metallurgy, and electronics research. High compression, high expansions in reverse flow digitally controlled engines are coupled with improvements in the gear reductions and joints. The helicopter achieves program goals set in July 1979 of low operating cost, efficient fuel consumption over a broad power range, modular maintenance, fewer parts and lower purchase price, and low specific weight. The power plant furnishes a take-off impulse of 625 kW with a continuous output of 560 kW, with a fuel consumption of 319-330 gr/kWh. Specific performance features are listed and comparisons are made with turbines of other manufacturers. M.S.K.

A82-33853 # The superalloys - Materials for gas turbine hot section components. J. P. Immarigeon (National Aeronautical Establishment, Ottawa, Canada). *(Canadian Aeronautics and Space Institute, Annual General Meeting, 28th, Montreal, Canada, May 11, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, Dec. 1981, p. 336-354. 80 refs.

Developments in materials technology for high temperature materials used in gas turbines are reviewed with emphasis on powder processing. Conditions under which turbine blades, vanes and disks operate are described, and material requirements for the three components are discussed. Advanced forming methods such as hot isostatic compaction of prealloyed powders and isothermal forging, and the rejuvenation of mechanical properties and subsequent recycling of used gas turbine components by hot isostatic pressing are considered. D.L.G.

A82-33854 # Operational testing of the LN-33 inertial navigation system. M. C. Mendrisky (Canadian Forces, Air Navigation School, Winnipeg, Canada). *(Canadian Symposium on Navigation, 4th, Halifax, Canada, Nov. 17, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, Dec. 1981, p. 355-362.

An evaluation was performed to determine the baseline performance of the LN-33 Inertial Navigation System (INS). Tests designed include determination of geographic position accuracy in the pure inertial mode, determination of alignment quality, and the determination of a recommended time interval between system calibrations. Results of the navigation system testing on the Aurora, concentrating on the Doppler and Omega integrated operation of the INS, indicate that navigation will be more accurate in these modes of operation due to bounding effects and the fact that the INS itself performs better in this aircraft. D.L.G.

A82-33855 # Mechanical and metallurgical considerations in extending the life of turbine blades. J. Liburdi and J. Wilson. *(Canadian Aeronautics and Space Institute, Annual General Meeting, 28th, Montreal, Canada, May 11, 1981.) Canadian Aeronautics and Space Journal,* vol. 27, Dec. 1981, p. 363-374. Research supported by the National Research Council.

The paper outlines a systematic approach to blade life extension. Methods of predicting blade life and establishing life trends are discussed, and methods of repairing typical airfoil damage on turbine blades are outlined with general guidelines on repair limits and the influence of dissimilar filler metals on stress patterns. As blades reach their critical life they may be rejuvenated using hot isostatic pressing and appropriate heat treatments. A mechanical analysis demonstrates that limited repairs are possible on physically damaged components, and at present, repairs using a weaker filler material are limited to the lower-stressed region of the blade, such as near the tip and on top of the shroud. D.L.G.

A82-33891 # CDS grows new muscles. D. P. Raymer (Rockwell International Corp., Advanced Systems Design Dept., Los Angeles, CA). *Astronautics and Aeronautics,* vol. 20, June 1982, p. 22-31. 5 refs.

Recent improvements in the Configuration Development System (CDS) are discussed. Various design tasks that CDS can carry out are described, including fuselage development, wing and tail surfaces, initial structural design, fuel tanks and landing gear. New CDS abilities are also described, including the creation of command files, the modeling of existing designs for analysis or visualization, and doing on-line conceptual analysis of problems such as aerodynamic center and lift and moment derivatives, and friction drag. CDS can do tasks for which it was not specifically designed, and can perform any task that can be done on a drafting board. For the occasional user, CDS gives a productivity ratio of about four to one, while experienced users can expect an average improvement approaching ten to one. C.D.

A82-33892 # High technology raises fighter force readiness. R. C. Little, W. P. Murden, and R. K. Schaefer (McDonnell Douglas Corp., St. Louis, MO). *Astronautics and Aeronautics,* vol. 20, June 1982, p. 38-45, 61.

Evolutionary trends in U.S. tactical aircraft are discussed, emphasizing the role of high technology. The progressive increase in service life is accompanied by improved reliability. While digital technology in the aircraft has become more complex, there has been simplification in a number of areas, including electrical and plumbing connectors, hydraulic filters and lubrication points. Maintainability improvements include built-in test equipment and the Avionics Intermediate Shop, which uses automated test equipment to isolate a fault to an individual plug-in module. Though tactical aircraft potentially can fly two sorties per day, they are actually flying less than one. The problem derives from insufficient support services, and needed improvements are discussed in detail. C.D.

A82-33893 # The National Airspace System plan. J. L. Helms and S. B. Poritzky (FAA, Washington, DC). *Astronautics and Aeronautics,* vol. 20, June 1982, p. 50-61.

Major decisions, programs, and modernization plans of the National Airspace System are discussed. Greater cockpit control, automated weather observation systems, computerized ATC, and independent airborne Traffic Alert and Collision Avoidance Systems (TCAS) are anticipated. Near-term improvements include conflict-resolution advisories, en route metering, and improved terminal automation systems. The integration of traffic flow management and the use of TCAS are discussed in detail. Improved weather data will be obtained through the use of Doppler-radar technology, improved data bases, ground-based automated weather systems, and a central weather processor. The planned national airspace data interchange network will upgrade communications, and the Federal Radionavigation Plan will streamline navigation services. A modernized voice switching and control system, self-contained navigation systems, a microwave landing system, greater airport capacity, and facility consolidation are contemplated, and the plan as a whole is expected to be cost-effective. C.D.

A82-33904 Runway end intersection design. R. W. Hutchins (FAA, Albuquerque, NM). *Airport Forum,* Apr. 1982, p. 53-55.

One of a number of airport design problems involves the design of runway intersections. Frequently the involved runways intersect near their physical ends, and additional design parameters have to be taken into account. While runway length requirements, construction cost, and land availability will probably be the dominant design considerations, significant improvements in safety, cost, and convenience can be achieved by the selection of a particular intersection configuration. The four basic types of multiple runway layouts are classified as parallel, crossing, 'open V', and 'closed V'. Attention is given to aspects of aviation safety, ground traffic circulation, construction cost, capacity, the use of full runway length, and Navaid visual aid interference. A runway end intersection analysis is conducted, and the importance of taxiway access is discussed. G.R.

A82-33909 **The next generation trainer.** *Military Electronics/Countermeasures*, vol. 8, May 1982, p. 38, 40-42, 66.

In connection with a number of drawbacks regarding the T-37 twinjet trainers currently being used and the age of these aircraft, the U.S. Air Force is considering the introduction of a fleet of modernized aircraft for use in training undergraduate pilots at Randolph Air Force Base, TX. The T-37 have been manufactured between 1955 and 1977. They lack pressurization for high-altitude training, modern ejection seats, and fuel-efficient engines. The four Next Generation Trainer (NGT) prototypes the Air Force is considering incorporate these and other updated features. The first delivery of 54 trainers is expected to be set for September 30, 1987, when the service life of the original T-37s expires. A description is presented of the major specifications and stage of development of each of the four NGT, giving attention also to the manufacturers' reasons as to why their individual NGTs should be purchased by the Air Force. G.R.

A82-33913 # **The ubiquitous helicopter.** A. Gessow (Maryland, University, College Park, MD). *AIAA Student Journal*, vol. 19, Winter 1981-1982, p. 3-7, 48.

The theory, aerodynamics, and operation of helicopters are outlined and the extension of current technology to future versions of the helicopter for various applications is anticipated. Differences between helicopter and fixed-wing aircraft flight and control are discussed, noting the greater difficulty in maintaining stability low speeds in gusty conditions with helicopters. Blade and hub advances are reducing the complexity of the blade articulation to the drive train and rotor weight and strength are being tightly controlled by the use of composite materials. The wide rotor diameter distributes loads over a large area, allows heavy cargo to be carried, and provides a gliding force during power-out descents. Various commercial and military applications are enumerated. M.S.K.

A82-33914 # **XV-15 - Foretelling things to come.** L. H. Erb (Bell Helicopter Textron, Fort Worth, TX). *AIAA Student Journal*, vol. 19, Winter 1981-1982, p. 22-25.

The development of workable configurations of tilt-rotor aircraft culminating in the XV-15 is traced. The aircraft take off with the rotors on either wing situated like those of a helicopter then tilt the blades forward to proceed with high-speed flight, which has to date been 300 kn maximum. The XV-15 proved that natural frequencies and aeroelasticity of the rotors and airframe could be combined in a stable system, and also reconfirmed the possibility of control in both helicopter and airplane modes, problems originally solved with the XV-3. Early applications for the craft are foreseen for offshore oil rigs and on destroyers and frigates of the Navy. M.S.K.

A82-33915 # **X-wing and the Navy V/STOL initiative.** R. M. Williams (U.S. Defense Advanced Research Projects Agency, Arlington, VA). *AIAA Student Journal*, vol. 19, Winter 1981-1982, p. 26-34. 8 refs.

The development of concepts for Navy use of sea control ships (SCS) which could take advantage of V/STOL aircraft capabilities in intensive combat situations is outlined. The X-wing aircraft is offered as a solution to basing antisubmarine warfare and sensor carrier aircraft on ships which are not intended as aircraft carriers, such as frigates and destroyers. Use of the VTOL aircraft would permit force projection beyond the radar horizon in the form of cruise and air-to-air missiles borne by the X-wing. Combining advances in circulation control/tandem wing aerodynamics, high stiffness composite materials, and shaft-moment-feedback/fly-by-wire controls, a craft with low disk loading became possible. The X-wing is powered by a turbofan, and pneumatic control allows elimination of blade cycle pitch, rotor blade articulation, flaps, slots, and ailerons. M.S.K.

A82-33916 # **Will ABC technology produce the next-generation helicopter.** A. W. Linden (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *AIAA Student Journal*, vol. 19, Winter 1981-1982, p. 35-37.

Design concepts developed in order to overcome the retreating-blade stall limitations on level air speed flight for helicopters are reviewed. Compound vehicles were tested to utilize the rotating blades' lift capabilities in hover and the fixed wings' high-speed flight capacity. Inherent instability and low power efficiencies ruled against the design, and dual, counter-rotating propellers were tried in an attempt to discard any need for lift on the retreating blade. The resulting XH-59A test aircraft has risen to over 25,000 ft, made 60 deg turns at 225 kn, and has exceeded 260 kn air speed. The blades are mounted without hinges or flexible elements, thus improving reliability, maintainability, and aircraft handling and controllability. M.S.K.

A82-33920 # **The U.S. airline industry - En route to deregulation.** E. Starkman (Dowling College, Oakdale, NY). *AIAA Student Journal*, vol. 20, Spring 1982, p. 30-36. 6 refs.

The Airline Deregulation Act of 1978 and its consequences for the airline industry in the United States are discussed. The act is argued to have been a product both of public sentiment for reduced government regulation of private enterprise and the particular maturity of the airline industry, and it is noted that the actual deregulation act was preceded by a period of de facto selective deregulation beginning in 1977. Provisions of the act included the establishment of a fully competitive airline industry and the gradual dismantling, by January 1, 1985, of the Civil Aeronautics Board. Airlines have responded to the act by strengthening high-cost, long-haul routes at the expense of shorter routes while seeking to maintain feeder routes, in the case of the larger airlines, and explosive growth and the formation of entirely new carriers in the case of local service carriers. A.L.W.

A82-33993 **Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980.** Symposium sponsored by the American Society for Testing and Materials. Edited by J. R. Newby (Armco, Inc., Middletown, OH) and B. A. Niemeier (Reynolds Metals Co., Richmond, VA). Philadelphia, PA, American Society for Testing and Materials (ASTM Special Technical Publication, No. 753), 1982. 332 p. $39.50.

Reports included in this volume provide a broad review of worldwide developments in forming metallic materials along with specifics for manufacturing and potential formability technologies. Papers are presented on the effect of aging on bulk formability of aluminum alloys, hot forming of aluminum-magnesium alloy sheet, application of formability assessment to autobody outer panels, and the influence of tooling temperature on the formability of stainless steel sheets. Other papers include material flow and defect formation in forging an airfoil shape from metal-matrix composites, the use of torsion testing to assess material formability, and computer-aided modeling of selected sheet metal forming processes. V.L.

A82-33994 **Formability of INCOLOY alloy MA 956 - An oxide dispersion strengthened sheet alloy.** M. L. Robinson (Inco Research and Development Center, Inc., Suffern, NY) and I. Astley (Wiggin Alloys, Ltd., Hereford, England). In: Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980. Philadelphia, PA, American Society for Testing and Materials, 1982, p. 147-158.

The formability of INCOLOY alloy MA 956 (Fe - 19.5 wt% Cr - 4.5 wt% Al), designed for uses such as combustor components in gas turbine engines, has been evaluated using tension testing, cup testing, and strain analysis via the grid technique. An attempt has been made to interrelate the measured formability indexes utilizing relationships developed for conventional sheet alloys. It is concluded that although the alloy studied does not have the high degree of formability typical of conventional alloys, it does exhibit a usable degree of formability and can be formed into simple shapes. V.L.

A82-33995 **Material flow and defect formation in forging an airfoil shape from metal-matrix composites.** T. Erturk (Middle East Technical University, Ankara, Turkey) and H. A. Kuhn (Pittsburgh, University, Pittsburgh, PA). In: Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980. Philadelphia, PA, American Society for Testing and Materials, 1982, p. 176-186.

Major defects that occur in the forging of a 2024 aluminum alloy matrix reinforced with 25 vol% 0.23-mm-diameter cold drawn bcc stainless steel wires are identified using compression tests on rectangular specimens. These defects include fiber shear failure and accompanying deviation from plane-strain; fiber/matrix interface decohesion and accompanying void formation; the occurrence of cracks at the convex surfaces of rectangular preforms in forgings involving bending; and nonuniformity in fiber distribution. Forming limit criteria for the prediction and the prevention of these defects are established, presenting the allowable stress states during forging and providing guidelines for the forging of airfoil shapes from rectangular preforms. V.L.

A82-33997 **Low-speed aerodynamic characteristics of wings with sweep discontinuities.** S. M. Ramachandra (Hindustan Aeronautics, Ltd., Design Bureau, Bangalore, India; Alfateh University, Tripoli, Libya) and S. Prakash (Hindustan Aeronautics, Ltd., Bangalore; Indian Space Research Organization, Vikram Sarabhai Space Centre, Trivandrum, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences*, vol. 4, Dec. 1981, p. 437-447. 19 refs.

It is shown that, using the concept of a discrete vortex filament shedding, Weissinger's method can be modified to determine the span-wise loading for wings with a sweep discontinuity. The sweep discontinuity is modeled by the introduction of a discontinuity in the equivalent vortex pattern chosen to replace the wing. The total lift, induced drag, pitching moment coefficients and span-wise location of the center of pressure have been found for a few wing geometries using De Young and Harper's procedure. An increase in the outboard sweep shifts the maximum load position outboard besides decreasing the overall lift and induced drag coefficients. High suction peaks appear at the pivot. (Author) strategic elements, advanced processing concepts, and the identification of alternate materials are considered. Cobalt, tantalum, columbium, and chromium, the supplies of which are 91-100% imported, are the materials of major concern. J.D.

N82-24356# Southwest Research Inst., San Antonio, Tex. Energy Systems Research Div.

IMPACT STUDY OF SYNTHETIC AND ALTERNATIVE FUEL USAGE IN ARMY AIRCRAFT PROPULSION SYSTEMS Final Report, Oct. 1980 - Jun. 1981

C. A. Moses and M. I. Valtierra Jul. 1981 166 p refs Sponsored in part by the Army Mobility Research and Development Command
(Contract N00140-80-C-2269)
(AD-A111046; SwRI-MED134) Avail: NTIS HC A08/MF A01 CSCL 21/4

The U.S. Army is concerned about the quality of future aircraft fuels and their compatibility with current engines and aircraft fuel systems. This impact study of synthetic and alternate fuel usage on Army aircraft propulsion and fuel systems addresses four technical areas: (1) The fuel scenario for Army aviation gas turbine fuels; (2) The effects of initial properties or the performance and durability of engine and fuel system components; (3) The identification of engines and fuel system components used in Army aircraft and their interface with the fuel; and (4) A review of qualification and certification procedures. Author (GRA)

N82-24474*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

ADAPTER FOR MOUNTING MICROPHONE FLUSH WITH THE EXTERNAL SURFACE OF THE SKIN OF A PRESSURIZED AIRCRAFT Patent Application

Robert B. Cohn, inventor (to NASA) Filed 14 Dec. 1981 14 p
(NASA-Case-FRC-11072-1; US-Patent-Appl-SN-330613) Avail: NTIS HC A02/MF A01 CSCL 14B

A mounting device for securing a microphone pick-up head flush with respect to the external surfaces of the skin of an aircraft for detecting shock waves is described. The mount includes a sleeve mounted internally of the aircraft for capturing and supporting an electronics package having the microphone pick-up head attached such that the head is flush with the external surface of the aircraft skin and a pressure seal is established between the internal and external surfaces of the aircraft skin. NASA

N82-24497*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DEVELOPMENT OF HIGH-SPEED ROLLING-ELEMENT BEARINGS. A HISTORICAL AND TECHNICAL PERSPECTIVE

Erwin V. Zaretsky 1982 28 p refs Presented at the SKF Seventy-Fifth Anniv. Celebration Meeting, Nieuwegin, Netherlands, 9 Jun. 1982; sponsored by SKF Research and Development Center
(NASA-TM-82884; E-1198; NAS 1.15:82884) Avail: NTIS HC A03/MF A01 CSCL 13I

Research on large-bore ball and roller bearings for aircraft engines is described. Tapered roller bearings and small-bore bearings are discussed. Temperature capabilities of rolling element bearings for aircraft engines have moved from 450 to 589 K (350 to 600 F) with increased reliability. High bearing speeds to 3 million DN can be achieved with a reliability exceeding that which was common in commercial aircraft. Capabilities of available bearing steels and lubricants were defined and established. Computer programs for the analysis and design of rolling element bearings were developed and experimentally verified. The reported work is a summary of NASA contributions to high performance engine and transmission bearing capabilities. R.J.F.

N82-24500# National Aerospace Lab., Amsterdam (Netherlands). Bauweisen und Werkstoffe Haupabt.

COMPARISON BETWEEN PROBABILITY OF DETECTION, SENSITIVITY, AND ACCURACY OF FIVE NONDESTRUCTIVE INSPECTION METHODS

E. A. B. deGraaf and P. deRijk 25 Jun. 1981 13 p refs In DUTCH; ENGLISH summary Presented at Europaeische Tagung fuer zerstoerungsfreie Pruefung, Vienna, 14-16 Sep. 1981
(NLR-MP-81038-U) Avail: NTIS HC A02/MF A01

Approximately 200 high strength steel (AISI4340) aircraft undercarriage retraction cylinders, only part of which contained fatigue tracks, were subjected to five different nondestructive tests by six inspectors. Penetrants, ultrasonic flaw detection, eddy currents, and magnetic measurements were used. Results of all these methods and inspectors were compared. Considerable scattering in the results was observed. The ultrasonic method reliability is low. The results of fluorescent color penetration and eddy currents are moderate. Due to its high reliability, magnetic inspection is preferred. Author (ESA)

N82-24501*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NONLINEAR STRUCTURAL AND LIFE ANALYSES OF A COMBUSTOR LINER

V. Moreno (Pratt and Whitney Aircraft Group, East Hartford, Conn.), G. J. Meyers (Pratt and Whitney Aircraft Group, East Hartford, Conn.), A. Kaufman, and G. R. Halford 1982 23 p refs Proposed for presentation at the Symp. on Advances and Trends in Struct. and Solid Mech., 4-7 Oct. 1982, Washington, D.C.; sponsored by NASA and Georgetown Univ.
(NASA-TM-82846; E-1216; NAS 1.15:82846) Avail: NTIS HC A02/MF A01 CSCL 20K

Three dimensional, nonlinear finite element structural analyses were performed for a simulated combustor liner specimen to assess the capability of nonlinear analyses using classical inelastic material models to represent the thermoplastic creep response of the one half scale component. Results indicate continued cyclic hardening and ratcheting while experimental data suggested a stable stress strain response after only a few loading cycles. The computed stress strain history at the critical location was put into two life prediction methods, strainrange partitioning and a Pratt and Whitney combustor life prediction method to evaluate their ability to predict cyclic crack initiation. It is found that the life prediction analyses over predicted the observed cyclic crack initiation life. E.A.K.

N82-24502*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EVALUATION OF INELASTIC CONSTITUTIVE MODELS FOR NONLINEAR STRUCTURAL ANALYSIS

Albert Kaufman 1982 22 p refs Presented at the Symp. on Nonlinear Constitutive Relations for High Temp. Appl., Akron, Ohio, 19-20 May 1982; sponsored by NASA and Akron Univ.
(NASA-TM-82845; E-1215; NAS 1.15:82845) Avail: NTIS HC A02/MF A01 CSCL 20K

The influence of inelastic material models on computed stress-strain states, and therefore predicted lives, was studied for thermomechanically loaded structures. Nonlinear structural analyses were performed on a fatigue specimen which had been subjected to thermal cycling in fluidized beds and on a mechanically load cycled benchmark notch specimen. Four incremental plasticity creep models (isotropic, kinematic, combined isotropic kinematic, combined plus transient creep) were exercised using the MARC program. Of the plasticity models, kinematic hardening gave results most consistent with experimental observations. Life predictions using the computed strain histories at the critical location with a strainrange partitioning approach considerably overpredicted the crack initiation life of the thermal fatigue specimen. S.L.

N82-24512# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Stuttgart (West Germany).

REPORT FROM THE WORKING PARTY ON NEW FIBER MATERIALS [AUS DER ARBEIT DES ARBEITSKREISES NEUARTIGE FASERWERKSTOFFE (ANF)]

C. Kensche 1981 12 p In GERMAN Presented at 5th Symp. fuer Segelflugzeugentwicklung, Brunswick, 16-17 Nov. 1981
Avail: NTIS HC A02/MF A01

The aims, activities and achievements of a working party on new fiber composites are discussed. Participants from industry and research institutions collaborated on the drafting of norms and specification sheets for these materials.. Further research items include experimentation test stands and standardization of test procedures. Results on maximum yield stresses under tension, compression or shear are given for various specimens as well as in relation to fuselages or hulls. Author (ESA)

N82-24514# Instituut TNO voor Werktuigkundige Constructies, Delft (Netherlands).

THE VIBRATORY BEHAVIOR OF A ROTATING PROPELLER

SHAFT. PART 4: VIBRATION TESTS OF A ROTATING PROPELLER SHAFT IN A RUBBER STERN TUBE BEARING
A. J. Francken and G. C. vanVelzen Dec. 1980 80 p refs
(Contract A76/KM/134)
(IWECO-5072208-81-Pt-2; TDCK-75126-Pt-2) Avail: NTIS HC A05/MF A01

Lateral shaft vibration was tested by measuring shaft and bearing response to horizontal and vertical excitation. Results show no change in shaft position between the nonrotating and the rotating shaft at speeds up to 120 RPM. Resonance frequencies and driving point mobility deviate < 3% from reported values. Damping at 120 RPM amounts to 5% of critical damping at both resonances. Author (ESA)

N82-24628# Western Geophysical Co. of America, Houston, Tex. Aero Service Div.
AIRBORNE GAMMA-RAY SPECTROMETER AND MAGNETOMETER SURVEY. IKPIKPUK RIVER QUADRANGLE, ALASKA, VOLUME 2 Final Report
Feb. 1981 108 p
(Contract DE-AC13-76GJ-01664)
(DE82-000314; GJBX-304-81-Vol-2) Avail: NTIS HC A06/MF A01

The flight path map, multiparameter profiles, histograms, and anomaly maps for uranium, thorium, potassium, uranium/potassium, uranium/thorium, d thorium/potassium are presented. Data was gathered during airborne gamma ray spectrometer and magnetometer survey flights over Alaska. DOE

N82-24629# Western Geophysical Co. of America, Houston, Tex. Aero Service Div.
AIRBORNE GAMMA-RAY SPECTROMETER AND MAGNETOMETER SURVEY. JAMESTOWN QUADRANGLE, NORTH DAKOTA, VOLUME 1 Final Report
Mar. 1981 85 p refs 2 Vol.
(Contract DE-AC13-76GJ-01664)
(DE82-004150; GJBX-353-81-Vol-1) Avail: NTIS HC A05/MF A01

During the months of June through October, 1980 an airborne high sensitivity gamma-ray spectrometer and magnetometer survey over eleven 20 x 10 quadrangles located in the states of Minnesota and Wisconsin and seven 20 x 10 quadrangles in North and South Dakota was conducted. The results obtained over the Jamestown map area of North Dakota are discussed. The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps, and computer printer maps. DOE

N82-24630# Western Geophysical Co. of America, Houston, Tex. Aero Service Div.
AIRBORNE GAMMA-RAY SPECTROMETER AND MAGNETOMETER SURVEY. JAMESTOWN QUADRANGLE, NORTH DAKOTA, VOLUME 2 Final Report
Mar. 1981 100 p 2 Vol.
(Contract DE-AC13-76GJ-01664)
(DE82-004169; GJBX-353-81-Vol-2) Avail: NTIS HC A05/MF A01

The flight path map, radiometric multiple-parameter stacked profiles, magnetic and ancillary parameter stacked profiles, histograms, anomaly maps for uranium, thorium, potassium, uranium/thorium, thorium/potassium, and uranium/potassium are given. Data was obtained during an airborne gamma-ray spectrometer and magnetometer survey of North Dakota. DOE

N82-24632# Western Geophysical Co. of America, Houston, Tex. Aero Service Div.
AIRBORNE GAMMA-RAY SPECTROMETER AND MAGNETOMETER SURVEY. UMIAT QUADRANGLE, ALASKA, VOLUME 2 Final Report
Feb. 1981 108 p refs 2 Vol.
(Contract DE-AC13-76GJ-03664)
(DE82-000312; GJBX-305-81-Vol-2) Avail: NTIS HC A06/MF A01

The flight path map, multiparameter profiles, histograms, and anomaly maps are presented for uranium, thorium, potassium, uranium/potassium, uranium/thorium, and thorium/potassium. This data was obtained using an airborne gamma spectrometer and magnetometer. DOE

N82-24636*# Parsons (Ralph M.) Co., Pasadena, Calif.
FUEL QUALITY PROCESSING STUDY, VOLUME 1 Final Report
J. B. OHara, A. Bela, N. E. Jentz, H. T. Syverson, H. W. Klumpe, R. E. Kessler, H. T. Kotzot, and B. L. Loran Apr. 1981 203 p refs 2 Vol.
(Contracts DEN3-183; DE-AI01-77ET-13111)
(NASA-CR-165327-Vol-1; DOE/NASA/0183-1; NAS 1.26:165327-Vol-1) Avail: NTIS HC A10/MF A01 CSCL 21D

A fuel quality processing study to provide a data base for an intelligent tradeoff between advanced turbine technology and liquid fuel quality, and also, to guide the development of specifications of future synthetic fuels anticipated for use in the time period 1985 to 2000 is given. Four technical performance tests are discussed: on-site pretreating, existing refineries to upgrade fuels, new refineries to upgrade fuels, and data evaluation. The base case refinery is a modern Midwest refinery processing 200,000 BPD of a 60/40 domestic/import petroleum crude mix. The synthetic crudes used for upgrading to marketable products and turbine fuel are shale oil and coal liquids. Of these syncrudes, 50,000 BPD are processed in the existing petroleum refinery, requiring additional process units and reducing petroleum feed, and in a new refinery designed for processing each syncrude to produce gasoline, distillate fuels, resid fuels, and turbine fuel, JPGs and coke. An extensive collection of synfuel properties and upgrading data was prepared for the application of a linear program model to investigate the most economical production slate meeting petroleum product specifications and turbine fuels of various quality grades. Technical and economic projections were developed for 36 scenarios, based on 4 different crude feeds to either modified existing or new refineries operated in 2 different modes to produce 7 differing grades of turbine fuels. A required product selling price of turbine fuel for each processing route was calculated. Procedures and projected economics were developed for on-site treatment of turbine fuel to meet limitations of impurities and emission of pollutants. R.J.F.

N82-24638*# Parsons (Ralph M.) Co., Pasadena, Calif.
FUEL QUALITY/PROCESSING STUDY. VOLUME 2: APPENDIX. TASK 1 LITERATURE SURVEY Final Report
J. B. OHara, A. Bela, N. E. Jentz, H. W. Klumpe, H. E. Kessler, H. T. Kotzot, and B. L. Loran Apr. 1981 274 p refs 2 Vol.
(Contract DEN3-183; DE-AI01-77ET-13111)
(NASA-CR-165327-Vol-2; DOE/NASA/0183-1; NAS 1.26:165327-Vol-2) Avail: NTIS HC A12/MF A01 CSCL 21D

The results of a literature survey of fuel processing and fuel quality are given. Liquid synfuels produced from coal and oil shale are discussed. Gas turbine fuel property specifications are discussed. On-site fuel pretreatment and emissions from stationary gas turbines are discussed. Numerous data tables and abstracts are given. R.J.F.

N82-24639# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Acoustics Dept.
AIRBUS INDUSTRY AND NOISE IN THE COMMUNITY
J. Chaussonnet 7 Jan. 1982 37 p Presented at Symp. on Aircraft Noise Johannesburg, 21 Oct. 1981; sponsored by South African Acoustic Inst.
(SNIAS-821-111-111) Avail: NTIS HC A03/MF A01

The contribution to the total perceived noise outside an aircraft during takeoff and landing, attributed to engines and the aerodynamics of the aircraft, is considered. Engine noise reduction by design, location of the engine, and by acoustic analysis of the nacelle is discussed. Aerodynamic noise reduction is treated in terms of aircraft design, operational procedures, and aircraft weight. The noise measurement facility used for checking operational procedures and measuring noise levels, is described. Results show that the acoustic noise of commercial aircraft can be significantly reduced. Author (ESA)

N82-24642# Societe Nationale Industrielle Aerospatiale, Toulouse (France). Service Controle Automatique du Vol.
FLIGHT MANAGEMENT COMPUTER
J. Grossin 7 Jan. 1982 26 p In FRENCH Presented at Soc. des Electriciens et des Radioelectriciens (SEE), Nice, 26 Nov. 1981 Submitted for Publication
(SNIAS-821-111-110) Avail: NTIS HC A03/MF A01

Ways in which automatic flight control can reduce fuel consumption were investigated. Three domains were identified:

A literature study for the techniques suitable for a portable wear metal analyzer has been conducted. The intent was to locate a technique which could lead to the development of a deployable field instrument to analyze metals in used aircraft engine oil for preventive maintenance purposes. Ten techniques, including six optical spectroscopic methods, two X-ray techniques, radioactive tagging, and colorimetry, were evaluated. Emphasis was placed on the fundamental limitations of each technique for this particular application. As a result, three optical techniques looked promising and their practicality was further investigated. The final assessment of these three techniques was based on the feasibility of making the instrument portable, low cost, able to analyze elements of interest, particle size independent, and with moderate power consumption. The three techniques, in order of suitability are: furnace atomic absorption spectroscopy, rotating disc electrode atomic emission spectroscopy, and dc plasma atomic emission spectroscopy. Author (GRA)

N82-25506# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
HARDWARE AND SOFTWARE INTEGRATION FOR CONCURRENT DATA ACQUISITION AND REDUCTION OF PHOTON CORRELATED LASER DOPPLER VELOCIMETRY M.S. Thesis
David L. Neyland Dec. 1981 139 p refs
(AD-A111146; AFIT/GA/AA/81D-10) Avail: NTIS HC A07/MF A01 CSCL 14/2

A general Automatic Data Acquisition System dedicated to a broad range of experiments is used to operate the Digital Correlation signal processing equipment of a Laser Doppler Velocimeter, transfer data from the correlator into the Automatic Data Acquisition System computer and perform computations with the information. The Laser Doppler Velocimeter is used to acquire vast quantities of velocity and turbulence intensity information describing turbulent fluid flow about two dimensional airfoils. Integration of the velocimeter with the computer increases the capability of the system to perform large scale fluid dynamic studies. GRA

N82-25516*# Illinois Univ., Chicago. Dept. of Materials Engineering.
MATHEMATICAL MODELS FOR THE SYNTHESIS AND OPTIMIZATION OF SPIRAL BEVEL GEAR TOOTH SURFACES Final Report
F. L. Litvin, Pernez Rahman, and Robert N. Goldrich Jun. 1982 122 p refs
(Grant NAG3-48)
(NASA-CR-3553; NAS 1.26:3553) Avail: NTIS HC A06/MF A01 CSCL 13I

The geometry of spiral bevel gears and to their rational design are studied. The nonconjugate tooth surfaces of spiral bevel gears are, in theory, replaced (or approximated) by conjugated tooth surfaces. These surfaces can be generated by two conical surfaces, and by a conical surface and a revolution. Although these conjugated tooth surfaces are simpler than the actual ones, the determination of their principal curvatures and directions is still a complicated problem. Therefore, a new approach, to the solution of these is proposed. Direct relationships between the principal curvatures and directions of the tool surface and those of the generated gear surface are obtained. With the aid of these analytical tools, the Hertzian contact problem for conjugate tooth surfaces can be solved. These results are useful in determining compressive load capacity and surface fatigue life of spiral bevel gears. A general theory of kinematical errors exerted by manufacturing and assembly errors is developed. This theory is used to determine the analytical relationship between gear misalignments and kinematical errors. This is important to the study of noise and vibration in geared systems. S.L.

N82-25520*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LUBRICANT EFFECTS ON EFFICIENCY OF A HELICOPTER TRANSMISSION
Andrew M. Mitchell and John J. Coy 1982 16 p refs Presented at the AGARD Symp. on Probl. in Bearings and Lubrication, Ottawa, Canada, 31 May - 4 Jun. 1982
(NASA-TM-82857; E-1226; NAS 1.15:82857; AVRADCOM-TR-82-C-9) Avail: NTIS HC A02/MF A01 CSCL 01C

Eleven different lubricants were used in efficiency tests conducted on the OH-58A helicopter main transmission using the NASA Lewis Research Center's 500 hp torque regenerative helicopter transmission test stand. Tests were run at oil-in temperatures of 355 K and 372 K. The efficiency was calculated from a heat balance on the water running through an oil to water heat exchanger which the transmission was heavily insulated. Results show an efficientcy range from 98.3% to 98.8% which is a 50% variation relative to the losses associated with the maximum efficiency measured. For a given lubricant, the efficiency increased as temperature increased and viscosity decreased. There were two exceptions which could not be explained. Between lubricants, efficiency was not correlated with viscosity. There were relatively large variations in efficiency with the different lubricants whose viscosity generally fell in the 5 to 7 centistoke range. The lubricants had no significant effect on the vibration signature of the transmission. A.R.H.

N82-25521# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.
CHEM-BRAZE ABRADABLE SEAL ATTACHMENT TO AIRCRAFT GAS TURBINE COMPRESSOR COMPONENTS Final Report, 1 Nov. 1979 - 31 Sep. 1980
Stephen T. Narsavage, Saed Safai, and Harold W. Pettit, Jr. St. Louis Army Aviation Research and Development Command Jan. 1982 71 p
(Contract DAAG46-79-C-0102)
(AD-A111692; PWA-FR-13975; USAAVRADCOM-TR-82-F-2; AMMRC-TR-82-6) Avail: NTIS HC A04/MF A01 CSCL 11/2

Manufacturing methods were established for bonding an abradable seal surface onto the stationary compressor element of small gas turbine engines utilizing an easily replaceable Chem-Braze bond system. Bonded specimens were prepared and evaluated in vibration and rub incursion tests. Tooling was fabricated for bonding a seal to Army supplied engine hardware, and NDI methods were established for inspecting bond integrity. Chemical stripping techniques for removing Chem-Braze attached seals were optimized to permit efficient refurbishment of severely worn seals. An economic analysis indicated significant cost savings for attaching abradable seals to compressor blade tip shrouds using the improved Chem-Braze system compared to attachment with gold-nickel braze. The Chem-Braze system has been used successfully to bond abradable seals to titanium, cobalt, nickel and iron base alloys; however, attempts to use Chem-Braze to bond seals to selected aluminum and magnesium alloys were not successful. Author (GRA)

N82-25545# Lockheed Missiles and Space Co., Palo Alto, Calif. Applied Mechanics Lab.
SUPPLEMENTARY STUDIES ON THE SENSITIVITY OF OPTIMIZED STRUCTURES Final Report, 14 Nov. 1979 - 29 Sep. 1980
Paul S. Jensen and W. A. Loden Wright-Patterson AFB, Ohio AFWAL Mar. 1981 81 p refs
(Contract F336150-76-C-3105; AF Proj. 2307)
(AD-A110994; AFWAL-TR-81-3013) Avail: NTIS HC A05/MF A01 CSCL 13/13

Reports of three related studies germane to structural optimization are provided. The first describes virtual memory simulator suitable for management of large quantities of numerical data such as required for sparse matrix manipulation. The second report describes two sparse matrix processors suitable for the large equation systems arising in structural analysis and provides comparative results. The last report describes a study of two optimization algorithms in the context of structural optimization. A number of test results for parameter studies and a general comparison of the two algorithms are given. GRA

N82-25613# Measurement Concept Corp., Rome, N. Y.
SOURCE ASSESSMENT SYSTEM Final Technical Report
Roy H. Senn, M. Lynn Taylor, Richard Burns, and Michael Smith Griffiss AFB, N.Y. RADC Nov. 1981 153 p refs
(Contract F30602-80-C-0040; AF Proj. 4303)
(AD-A111223; RADC-TR-81-303) Avail: NTIS HC A08/MF A01 CSCL 09/2

This report contains an analysis of the Source Assessment Procedures at both Defense Mapping Agency (DMA) production facilities (Aerospace Center DMAAC in St. Louis MO and Hydrographic Topographic Center DMAHTC in Washington DC). Following the analysis, the report documents a design trade off of various approaches to a Source Assessment System. Finally, a Design Plan for the selected approach analog-digital video system, is presented. Author (GRA)

N82-25623# Western Geophysical Co. of America, Houston, Tex. Aero Service Div.
AIRBORNE GAMMA-RAY SPECTROMETER AND MAGNETOMETER SURVEY. BARROW QUADRANAGLE, ALASKA, VOLUME 2 Final Report
Mar. 1981 63 p refs 2 Vol.
(Contract DE-AC13-76GJ-01664)
(DE82-000342; GJBX-295-81-Vol-2) Avail: NTIS HC A04/MF A01

Volume II contains the flight path map, multiparamenter profiles, histograms, and anomaly maps for potassium, uranium, thorium, uranium/potassium, uranium/thorium, and thorium/potassium. GRA

N82-25636*# Detroit Diesel Allison, Indianapolis, Ind.
LOW NOx HEAVY FUEL COMBUSTOR CONCEPT PROGRAM Final Report
A. S. Novick and D. L. Troth Oct. 1981 206 p refs
(Contracts DEN3-148; DE-AI01-77ET-13111)
(NASA-CR-165367; NAS 1.26:165367; DDA-EDR-10594; DOE/NASA/0148-1) Avail: NTIS HC A10/MF A01 CSCL 10B

The development of the technology required to operate an industrial gas turbine combustion system on minimally processed, heavy petroleum or residual fuels having high levels of fuel-bound nitrogen (FBN) while producing acceptable levels of exhaust emissions is discussed. Three combustor concepts were designed and fabricated. Three fuels were supplied for the combustor test demonstrations: a typical middle distillate fuel, a heavy residual fuel, and a synthetic coal-derived fuel. The primary concept was an air staged, variable-geometry combustor designed to produce low emissions from fuels having high levels of FBN. This combustor used a long residence time, fuel-rich primary combustion zone followed by a quick-quench air mixer to rapidly dilute the fuel rich products for the fuel-lean final burnout of the fuel. This combustor, called the rich quench lean (RQL) combustor, was extensively tested using each fuel over the entire power range of the model 570 K engine. Also, a series of parameteric tests was conducted to determine the combustor's sensitivity to rich-zone equivalence ratio, lean-zone equivalence ratio, rich-zone residence time, and overall system pressure drop. Minimum nitrogen oxide emissions were measured at 50 to 55 ppmv at maximum continuous power for all three fuels. Smoke was less than a 10 SAE smoke number. M.G.

N82-25661*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
IN SITU OZONE DATA FOR COMPARISON WITH LASER ABSORPTION REMOTE SENSOR: 1980 PEPE/NEROS PROGRAM
David S. McDougal, Robert B. Lee, III, and Richard J. Bendura May 1982 42 p refs
(NASA-TM-84471; NAS 1.15:84471) Avail: NTIS HC A03/MF A01 CSCL 13B

Several sets of in situ ozone (O3) measurements were made by a NASA aircraft in support of the laser absorption spectrometer (LAS) remote sensor. These measurements were designed to provide comparative O3 data for the LAS sensor. The LAS, which was flown on a second aircraft, remotely measured the vertical burden of O3 from the aircraft to the surface. In situ results of the air quality (O3 and B sub scat) and meteorological (temperature and dewpoint) parameters for three correlative missions are presented. The aircraft flight plans, in situ concentration profiles and vertical burdens, and measurement errors are summarized. B.W.

N82-25811*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN ASSESSMENT OF THE REAL-TIME APPLICATION CAPABILITIES OF THE SIFT COMPUTER SYSTEM
Ricky W. Butler Apr. 1982 17 p refs
(NASA-TM-84482; NAS 1.15:84482) Avail: NTIS HC A02/MF A01 CSCL 09B

The real-time capabilities of the SIFT computer system, a highly reliable multicomputer architecture developed to support the flight controls of a relaxed static stability aircraft, are discussed. The SIFT computer system was designed to meet extremely high reliability requirements and to facilitate a formal proof of its correctness. Although SIFT represents a significant achievement in fault-tolerant system research it presents an unusual and restrictive interface to its users. The characteristics of the user interface and its impact on application system design are assessed. Author

N82-25827# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Structures Test Branch.
STRUCTURES TESTING ANALYSIS REAL-TIME NETWORK (STARNET) Final Technical Report, Feb. 1978 - Feb. 1981
Robert L. Denison Oct. 1981 93 p
(AF Proj. 1347; AF Proj. 2401)
(AD-A111636; AFWAL-TR-81-3112) Avail: NTIS HC A05/MF A01 CSCL 14/2

The computer network employed for data acquisition and processing in the Structures Test Facility of the Air Force Wright Aeronautical Laboratories, Building 65, Area B, Wright-Patterson AFB, is extensively described. The report includes a system overview and discussions of subsystem characteristics and interconnections, system software, applications software, system operation, and a review of a large-scale network mode application. This computer network, called STARNET, is an on-line, real-time system. Author (GRA)

N82-26006# Hughes Research Labs., Malibu, Calif.
SILICON LIQUID CRYSTAL LIGHT VALVE FOR FLIGHT SIMULATION APPLICATIONS Final Report
U. Efron, J. Grinberg, P. G. Reif, and P. Braatz Brooks AFB, Tex. AFHRL Nov. 1981 118 p refs
(Contract F33615-79-C-0024; AF Proj. 2363)
(AD-A110928; AFHRL-TR-81-35) Avail: NTIS HC A06/MF A01 CSCL 20/2

The basic objective of this program has been to develop a silicon photoconductor liquid crystal light valve (Si LCLV) for application in wide-field-of-view simulators. The Si LCLV is expected to offer several advantages over the cadmium sulfide (CdS) photoconductor LCLV, including higher sensitivity, a significantly better switching ratio, higher resolution, and (most importantly) a fast response time to allow higher 60-Hz operation. The main thrust of this program was to upgrade the device in the following areas: (1) Scale up to a 2-inch aperture device (from a 1 cm x 1 cm active area). (2) Implement the silicon/silicon dioxide (Si/SiO2) dielectric mirror and improve the light blocking layer. (3) Upgrade device resolution by optimizing the focusing grid. (4) Increase the contrast ratio by improving silicon processing. (5) Implement the dc-biased guard ring to prevent edge breakdown. (6) Optimize liquid crystal operation to reduce the reponse time. Significant improvements were achieved in all areas. GRA

N82-26162# Indian Inst. of Tech., Bombay. Dept. of Aeronautical Engineering.
INVESTIGATION ON ROTATING AILERONS
S. Mozumdar and T. S. Patel *In* Indian Inst. of Science The J. of the Aeron. Soc. of India, Vol. 32, No. 1-4, Feb.-Nov. 1980 Nov. 1980 p 1-5 refs

Avail: NTIS HC A08/MF A01

The effectiveness of rotating ailerons in a subsonic flow was theoretically studied with a view to evaluate their capability in comparison to the conventional ones. The present analysis is based on the vortex lattice approach of Byelotserkovskii for different wing planforms of small and large aspect ratios. The effect of such ailerons on the coefficients of lift and rolling moment was worked out for their positions corresponding to the most suitable positions of rotating flaps. Author

N82-26184# CIERS Research and Consultancy Private Ltd., Bangalore (India).
PRIMARY SEWAGE TREATMENT PLANT AS A SOURCE OF BIRD HAZARDS AT AIRPORT
S. C. Pillai, M. K. C. Sridhar, and G. Kasi Viswanath *In* Indian Inst. of Science The J. of the Aeron. Soc. of India, Vol. 32, No. 1-4, Feb.-Nov. 1980 Nov. 1980 p 149-153 refs

Avail: NTIS HC A08/MF A01

Quantitative observations were made on the visits of different kinds of birds, notably eagles or kites and crows, and on their movements around the different parts of the primary sewage treatment plant located in the neighborhood of the airport at Bangalore. The following information is reported: (1) early records on collisions between birds and aircrafts; (2) bird strike as a world wide problem; (3) the reasons for the attraction of birds to airports; (4) early attempts to solve the problem of bird hazards;

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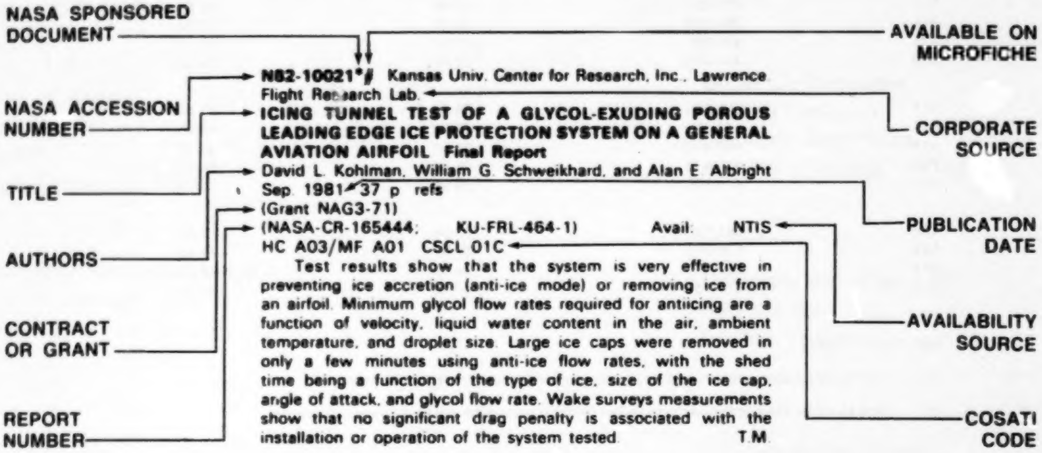

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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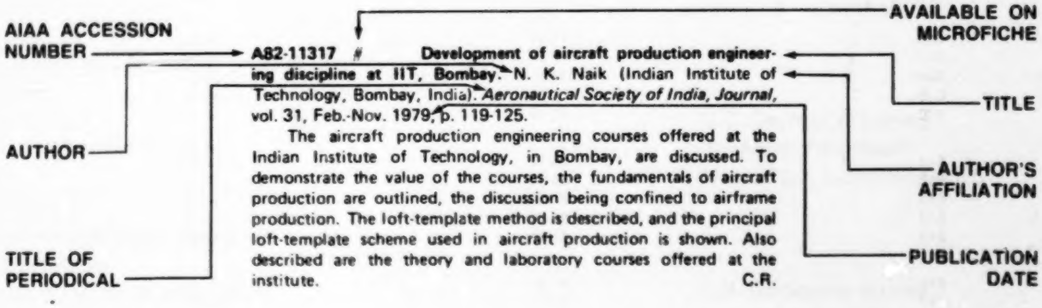

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

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SEPTEMBER 1982

IAA ENTRIES

A82-31824 # **Identification of the form of motion of an aircraft (Identyfikacja postaci ruchu samolotu).** A. Banasik. *Instytut Lotnictwa, Prace,* no. 86, 1981, p. 13-25. In Polish.

Methods for identifying the form of the motion of an arbitrary vibrating system described by a set of ordinary linear equations with constant coefficients are surveyed. The fundamental parameters of the set of equations (the state matrix, the state vector, and the dynamic stability criterion) are determined on the basis of calculated eigenvalues. The eigenvectors corresponding to particular eigenvalues are determined, which characterizes the state vector for a given eigenvalue. Particular emphasis is placed on an identification method which consists in obtaining an analytic solution of the system of differential equations of motion. Numerical examples are presented concerning the lateral dynamic stability of an aircraft treated as a rigid body. B.J.

A82-31853 * # **Approximate method of predicting heating on the windward side of Space Shuttle Orbiter and comparisons with flight data.** H. H. Hamilton, II (NASA, Langley Research Center, Space Systems Div., Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0823.* 15 p. 30 refs.

An approximate method is developed for predicting laminar and turbulent heating rates on the windward side of the Space Shuttle Orbiter for both the wind-tunnel and flight environments. The method is based on a 'local infinite swept cylinder' analysis and includes both equilibrium-air chemistry and variable boundary-layer-edge entropy. The method is validated by comparing with data from wind-tunnel experiments and from the first and second Space Shuttle flights both along the windward-symmetry plane and in a lateral direction off the symmetry plane. Agreement with the flight data is good from approximately 67 km (peak heating) downward. (Author)

A82-31871 # **Thermodynamic performance of an airplane wing leading edge anti-icing system.** R. Ross (Ross Aviation Associates, Sedgwick, KS). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0851.* 5 p.

Flight data gathered from dry air tests are used to develop a procedure that will predict the spanwise and chordwise surface temperature distribution for any aircraft for either dry air or icing conditions. It is shown that wing leading edge surface temperatures can be estimated within plus or minus 5% for dry air and plus or minus 10 percent for natural icing for a wide range of aircraft conditions. The method is somewhat conservative for dry air conditions and quite conservative for icing conditions. (Author)

A82-31883 * # **Radiation enhancement by nonequilibrium during flight through the Titan atmosphere.** C. Park (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0878.* 16 p. 40 refs.

The chemical reactions occurring in the adiabatic inviscid shock layer over a two-dimensional wedge flying through Titan's atmosphere are calculated. Radiative transfer through the shock layer is calculated, accounting for the deviation of electronic state populations from the equilibrium distributions, to determine the heat flux reaching the edge of the boundary layer of the proposed Titan Aerocapture vehicle. The heat fluxes are found to be larger by a ratio of up to 100,000 than those calculated under the assumption of equilibrium flow. For a typical flight, the radiative heat load reaching the edge of the boundary layer is 3.4 x 10 to the 5th J/sq cm, which is 5.7 times the equilibrium value. (Author)

A82-31891 * # **An experimental investigation of interfacial temperatures in blade-seal material rubbing of aircraft compressors.** A. F. Emery, J. Wolak, S. Etemad, and S. R. Choi (Washington, University, Seattle, WA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0890.* 8 p. 5 refs. NASA-sponsored research.

Results are presented for the rubbing of rotating (100 m/s) titanium blade specimens, with different plasma-sprayed tip coating, against an abradable porous seal material at two different incursion rates. In general, there was a good correspondence between the average transverse force of rubbing and the seal specimen surface temperature. Instantaneous seal surface temperature measurement showed a significant temperature jump before and after each rubbing with a high rate of cooling during each revolution and a high overall temperature level. Numerical predictions of both blade and seal temperature agreed well for the bare blade tip experiments but were consistently high for the coated blades. This suggests that the thermal properties of the coatings may significantly affect the temperatures and hence the wear characteristics of the system. (Author)

A82-31898 * # **Design, fabrication and test of liquid metal heat-pipe sandwich panels.** A. Basiulis (Hughes Aircraft Co., Torrance, CA) and C. J. Camarda (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0903.* 8 p. 9 refs.

Integral heat-pipe sandwich panels, which synergistically combine the thermal efficiency of heat pipes and the structural efficiency of honeycomb sandwich panel construction, were fabricated and tested. The designs utilize two different wickable honeycomb cores, facesheets with screen mesh sintered to the internal surfaces, and potassium or sodium as the working fluid. Panels were tested by radiant heating, and the results indicate successful heat pipe operation at temperatures of approximately 922 K (1200 F). These panels, in addition to solving potential thermal stress problems in an Airframe-Integrated Scramjet Engine, have potential applications as cold plates for electronic component cooling, as radiators for space platforms, and as low distortion, large area structures. (Author)

A82-31922 # **A system for the numerical simulation of sub- and transonic viscous attached flows around wing-body configurations.** J. van der Vooren, J. T. van der Kolk, and J. W. Slooff (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO,*

A82-34007 * # **A review of Reynolds number studies conducted in the Langley 0.3-m Transonic Cryogenic Tunnel.** E. J. Ray (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0941.* 15 p. 26 refs.

Initial proof-of-concept results obtained in a pilot transonic tunnel, led to a U.S. decision to apply the cryogenic tunnel concept to the National Transonic Facility (NTF). The pilot tunnel was reclassified as a 'permanent' facility and renamed the 0.3-m Transonic Cryogenic Tunnel (TCT). The 0.3-m TCT, with its ability to operate at temperatures ranging from about 78 K to 340 K, combined with a 6 atmospheres pressure capability, provides extremely high test Reynolds numbers at relatively low model loading. In addition, the ability to vary pressure and temperature independently of Mach number provides a unique capability to conduct studies at a constant dynamic pressure or at a constant Reynolds number with just one model. Attention is given to the simulation of flight conditions, the cryogenic-pressure tunnel concept, the characteristics of the 0.3-m TCT, Reynolds number studies in the three-dimensional test section including a Space Shuttle study, and Reynolds number studies in the two-dimensional test section. G.R.

A82-34008 * # **Wing flap-type control effectiveness and effects of control hinge gap seals for a supercritical wing.** E. L. Anglin and T. A. Byrdsong (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0960.* 14 p. 11 refs.

Wind-tunnel tests were made to investigate the control effectiveness of wing trailing-edge flap-type aerodynamic controls for a supercritical wing. The tests determined the effects of spanwise flap control location, two different wing transition grit location patterns, magnitude of angular control deflection, control hinge moments and control hinge gap seals. Results show that the inboard flap position deflections caused interference rearward at the vertical tail, and that all flap positions for deflections in one direction only caused interference at the horizontal tail at a higher than design Mach number. Changes in wing transition grit pattern caused significant changes to static longitudinal characteristics and longitudinal control effectiveness. D.L.G.

A82-34101 * **International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981.** Symposium sponsored by the U.S. Department of Commerce, NASA, and U.S. Air Force. Edited by J. Grey (American Institute of Aeronautics and Astronautics, New York, NY) and L. A. Hamdan. New York, American Institute of Aeronautics and Astronautics (AIAA Aerospace Assessment Series. Volume 6), 1982. 318 p. Members, $25.; nonmembers, $30.

The status of aerospace industrial development in various countries is summarized, and specific areas of current and future progress are discussed. The first Shuttle astronauts recount details of the flight and performance of the initial Columbia mission and an attempt to assess the importance of the Shuttle as a milestone in transportation systems is presented. ESA space activities are reviewed, including the impact of space programs on European industries and employment. Attention is also given to Japanese and Chinese space programs. The evolution of communications satellites is traced and projections are made for near-term satellite requirements to be incorporated in the construction of Intelsat VI. Finally, advances in production of military jets and helicopters are considered, along with candidate alternate fuel systems to replace petroleum products. M.S.K.

A82-34108 # **Military aircraft and international policy.** B. Revellin-Falcoz (Avions Marcel Dassault-Breguet Aviation, Vaucresson, Hauts-de-Seine, France). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 107-112.

The benefits to an aerospace company manufacturing aircraft which can be adapted to a variety of specific military uses are discussed. The practice is asserted to create production flexibility and increase sales by allowing a basic design to be reconfigured for different buyers and to the same buyer over a number of years. One drawback is that spare parts production must continue over the years for versions which are no longer produced, although some savings are realized in a commonality among different generations of the same aircraft. Sales are noted to be most favorably concluded through the use of a prime contractor who controls all details of a deal, while still answering to the demands and suggestions of all partners and parties involved. Finally, it is mentioned that weapons exports make up for one-quarter of the national cashflow which leaves France for purchases of oil. M.S.K.

A82-34109 # **Commercial transport developments for the 1980's.** J. E. Steiner (Boeing Co., Seattle, WA). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 115-139.

A review is presented of the technology currently incorporated into modern air transportation vehicles and trends for the future are discussed. Reducing fuel consumption has led to the adoption of the high-bypass ratio turbofan, which has also provided significant noise reduction. Wings are being designed with less sweep in order to be more fuel efficient, and combined with new airfoil configurations and fuel-efficient cruise speeds. The commonality of solutions to efficiency problems has led to increasing homogeneity in the design, structure, and components of aircraft built by different manufacturers. Equipment which is not cost-effective tends to be grounded as soon as possible, with new aircraft operating at 40-60% economic improvement over previous generations. A shift to smaller, commuter aircraft is foreseen, along with composite primary structures, full-scale active controls, and a reduction in wing and tail sizes. M.S.K.

A82-34110 # **Military aircraft - The way ahead.** D. Smallwood (British Aerospace Public, Ltd., Co., Weybridge, Surrey, England). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. (A82-34101 16-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 141-147.

Performance and mission requirements for present and future combat aircraft are explored, with a focus on NATO forces in central Europe. Survivability of the aircraft is stressed, particularly in scenarios where airfields have little chance of remaining intact, which is seen as a driving force for near-term operational capability for V/STOL aircraft. Additional necessities for all-weather and climatic conditions operations are listed in addition to nighttime performance ability in all combat modes. Improvements are likely to be forthcoming in the area of composite structures, higher performance engines, and continued automation of avionics and weapons systems, as well higher-resolution radars and task integration in the digitized cockpit avionics displays. M.S.K.

A82-34111 # **The military helicopter market today and tomorrow.** D. O. Smith (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 149-153.

Demands and the status of the present world helicopter market are discussed with an emphasis on military applications. Approximately 29,300 units are expected to be sold in the period 1981-1990, with a total price tag of $29.2 billion, not counting spare parts. Currently, the Sikorsky Black Hawk is being employed by the U.S. Army for carrying combat troops and equipment, while the UH-60A is used as a cargo transport with a capacity of 4 tons. Attack, surveillance, and mine laying are other functions assigned to military helicopters. Development of new helicopters in the U.S. is noted to take seven years, and an estimated 3% of all U.S. helicopters are now over 15 yr. old. M.S.K.

A82-34112 # **Development of an aircraft engine.** J. Calmon (SNECMA, Paris, France). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 155-163.

The evolution of designs in jet engines, requirements which lead to the incorporation of modifications and improvements, and the cooperation between companies to produce the engines are considered in terms of the development of a currently available GE engines. The TF 39 was certified in 1968 for the C5A, experienced a modification in the low-pressure section for use in the DC 10-10, and underwent further changes to be employed in the DC 10-30, A300, and 747, becoming the CF6-50 along the way. The CF6-80 is the next step and will feature a shorter combustion chamber and no turbine midframe. Increasing the fan diameter augments the thrust, and it is noted that 60,000 test hours have accrued on the engine up to 1981. Development, production, and product support for the CFM56 engine is shared 50-50 between GE and SNECMA, and features new materials and electronic fuel control to obtain increased fuel efficiencies. M.S.K.

A82-34113 # **Solutions to the aviation fuel problem.** W. M. Hawkins (Lockheed Aircraft Corp., Burbank, CA). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 165-180.

Projections of the duration of availability of petroleum-derived jet fuels are reviewed and candidates for alternative fuels are discussed. World production of crude oil is expected to begin to irreversibly decline in the 1990s, and the design of new aircraft which could use alternative fuels is noted to depend strongly on the new fuels which have yet to be chosen. Any new fuel supply will be required to have a low producibility cost, be continuously replenishable, be available for multiple uses, be easy to handle and transport, safe to use, cause no major changes in equipment, and be minimally polluting. An additional consideration is that the fuel could be derived where used to avoid the political problems inherent in current fuel supplies. Liquid hydrogen is found to be the best solution because of light weight, water as the source, available everywhere, and costs less than shale or coal-derived fuels. M.S.K.

A82-34114 # Aeronautical research and development. P. Poisson-Quinton (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 181-205. 7 refs.

Aerospace research and development is examined in terms of its role in progress, the necessity for industry, government, and user cooperation, the functions of ONERA, and research results which are beginning to pay off. Research is being channeled by advances in electronics and computer abilities, and balances are needed between basic and applied research funding. Government programs are noted to specifically center around risky and/or long term research, while industry concentrates its efforts on near-term evolutionary studies. ONERA research departments are reviewed, along with outlines of wing fabrication development techniques, the transonic propeller, and a carbon fiber wing. The development of active control systems has resulted in increased fuel efficiencies. The interactions between AGARD, ONERA, NASA, and GARTEUR are outlined. M.S.K.

A82-34120 # Technical trends in the civil aircraft and helicopter industry. R. Chevalier (Société Nationale Industrielle Aérospatiale, Paris, France). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 263-273.

Technical prospects for improvements in aerodynamics, weight savings, propulsion, and navigational systems in the civil air transportation industry in the next two decades are projected. Aerodynamics will encounter more wing-span for efficiency, decreased wing sweep for better low-speed control, and thicker airfoils for improved fuel efficiency. Composites and structures modeled by computer are foreseen as contributing to 15-26 percent in weight savings by the year 2000. The families of future engines include the introduction of high temperature and compression ratio turbofans and turboprops, in addition to propfans, which feature high efficiency at speeds of Mach 0.7 and above. Microminiaturization of electronics is expected to produce another order of weight reduction equal to that already achieved, in addition to improved safety, handling qualities, and control. Greater use of civil helicopters and supersonic transport is predicted. M.S.K.

A82-34121 # Military aircraft. H. F. Rogers (General Dynamics Corp., St. Louis, MO). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 275-290.

Even though the emergence of sustained supersonic cruise and maneuvering as a useful tactical tool is foreseen, no significant expansion of the current operational envelopes of fighters is now in prospect. Maximum speeds at altitude will be in the Mach 2.0-2.2 region, and maximum speeds at sea level will not significantly deviate from the current value of Mach 1.2. Two important uncertainties in the air-to-air arena are (1) positive, all-weather, beyond-visual-range identification and (2) warning and control in a high-density environment. In designing aircraft, the need for realistic requirements, balancing unit (aircraft) effectiveness against total force effectiveness, is stressed. Also considered important is the use of hybrid technology, that is, the careful integration across classic technological disciplines to achieve enhanced operational capability with a more efficient solution. A third requirement is a modular design approach. C.R.

A82-34123 # Business jets to agricultural aircraft - An overview of general aviation. J. H. Winant (National Business Aircraft Association, Washington, DC). In: International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981. New York, American Institute of Aeronautics and Astronautics, 1982, p. 295-300.

Attention is given to the inroads that have been made in the American market by foreign firms. In the turboprop field, which is seen as the area of strongest potential growth in the years immediately ahead, the United States continues to dominate. Attention is also given to the technological importance of business aircraft. The traditional technological spinoff roles appear to be reversing themselves; business aircraft, for so many years inheritors of design concepts born in the military and air transport aircraft industries, are now moving into the position of being the source for significant innovation. Three important technological challenges seen in business aviation are the problem of noise, the need to make aircraft lighter and more slippery, and the development of alternative fuels. C.R.

A82-34125 Fatigue life prediction of helicopter pitch link using Kaman life calculation methods. C. P. Hardersen (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, Specialists Meeting on Helicopter Fatigue Methodology, St. Louis, MO, Mar. 1980, Paper.* 12 p.

This paper uses information supplied by the Army to arrive at a final calculated life for a pitch link component. Discussions are presented on the handling of strength data, load data, and frequency data in the context of a fatigue life computer program. Load and strength are presented as statistics which are randomly combined using Monte Carlo techniques. Improvements in technique could include the consideration of statistical variation on mission, statistical consideration of multi-mode failures, and improved cycle-by-cycle evaluation techniques. (Author)

A82-34127 † Periodic boundary value problem for the equations of the harmonic oscillation of a rotor blade about the axis of a flapping hinge (Periodicheskaia kraevaia zadacha dlia uravnenii garmonicheskikh kolebanii lopasti nesushchego vinta otnositel'no osi gorizontal'nogo sharnira). V. S. Vozhdaev. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 9-18. 5 refs. In Russian.

The numerical calculation of the aerodynamics of a hinged rotor in an oblique flow in terms of blade theory is examined. It is shown that the transformation of the system of coupling equations and equations of the flywheel motion of the blade in blade theory into a system of coupling equations leads to an equation for harmonic oscillations with periodic boundary conditions. A solution to the problem is found in integral form, allowing the solution of the corresponding difference equation expressed in terms of Chebyshev polynomials and related mixed polynomials. The differential equation of flywheel motion is then transformed into the form of an integral Fredholm equation of the second kind. A.L.W.

A82-34128 † Finite element calculation of the aerodynamic forces on a vibrating wing in supersonic flow (Raschet metodom konechnykh elementov aerodinamicheskikh sil na kolebliushchemsia kryle v sverkhzvukovom potoke). V. G. Bun'kov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 19-26. In Russian.

A finite element method is used to calculate the aerodynamic forces on a thin wing with supersonic trailing edges. Velocity potential and deformations are determined for a wing partitioned into both trapezoidal and triangular finite elements by the use of a matrix of aerodynamic influence coefficients expressing the effects of pressure differences on each node. Results of calculations are presented which demonstrate the effects of the Mach and Strouhal numbers on flutter characteristics. A.L.W.

A82-34132 † Similarity parameters for the geometric structure of a supersonic jet propagating in a channel and in a submerged space (Parametry podobiia geometricheskoi struktury sverkhzvukovoi strui, rasprostraniaiushcheisia v kanale i zatoplennom prostranstve). E. A. Leites. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 54-63. 14 refs. In Russian.

An approximate method is used to determine the linear length scales of a jet propagating in a cylindrical channel or a submerged space. The method is based on a linearization of the differential equations of motion for an inviscid compressible, nonheat-conducting perfect fluid a sufficient distance from the nozzle exit to obtain a relation between the longitudinal and transverse length scales. The analytical relations obtained are shown to be in agreement with experimental data and the results of numerical studies for a wide range of flow parameters for axisymmetric and plane jets. A.L.W.

A82-34135 † Temperature fields in three-layer panels with a honeycomb filler during unsteady heating (Temperaturnye polia v trekhsloinykh paneliakh s sotovym zapolnitelem pri nestatsionarnom nagreve). S. N. Ivanov and M. A. Morozov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 97-104. 5 refs. In Russian.

The unsteady temperature fields in a three-layer panel with a honeycomb filler are calculated by an approximate method. Equations for heat balance in elements of the filler and sheathings with temperature-dependent thermophysical properties were solved under conditions of unsteady nonuniform heating, with the effective thermal conductivity of the filler in a direction parallel to the sheathing determined taking into account both conductive and radiative heat transfer along the honeycombs. Calculated temperature distributions are compared with those measured for the upper and lower sheathings of a three-layer panel with and without edge ribs heated along a narrow band of the center section to temperatures of up to 800 C to demonstrate the validity of the approach. A.L.W.

A82-34136 † Detached flow past V-shaped low-aspect-ratio wings (Otryvnoe obtekanie V-obraznykh kryl'ev malogo udlineniia). S. K. Betiaev, M. I. Grigor'ev, and G. G. Sudakov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 105-109. 8 refs. In Russian.

The aerodynamic characteristics of a V-shaped wing are investigated theoretically and experimentally as a function of wing dihedral angle. Experiments were performed with a wing model with a sweep of 80 deg and dihedral angles from 0 to 40 deg attached to a conical body at angles of attack from -5 to 16 deg and free-stream Mach numbers of 0.6 and 1.1. Theoretical calculations were carried

(1) thrust optimization, (2) optimization of in-flight aerodynamic configuration, and (3) flight plan optimization. The use of flight management computers to achieve these goals is discussed and recently developed equipment is depicted. System design and functions are explained. The choice of performance optimization criteria (cost index) is considered. How a flight management computer deals with horizontal navigation is treated as an example. Author (ESA)

N82-24845*# Research Triangle Inst., Research Triangle Park, N. C. Systems and Measurements Div.
PRODUCTION OF RELIABLE FLIGHT CRUCIAL SOFTWARE: VALIDATION METHODS RESEARCH FOR FAULT TOLERANT AVIONICS AND CONTROL SYSTEMS SUB-WORKING GROUP MEETING
J. R. Dunham, ed. and J. C. Knight, ed. (Virginia Univ.) May 1982 27 p refs Meeting held at Research Triangle Park, N.C., 2-4 Nov. 1981
(NASA-CP-2222; L-15291; NAS 1.55:2222) Avail: NTIS HC A03/MF A01 CSCL 09B

The state of the art in the production of crucial software for flight control applications was addressed. The association between reliability metrics and software is considered. Thirteen software development projects are discussed. A short term need for research in the areas of tool development and software fault tolerance was indicated. For the long term, research in format verification or proof methods was recommended. Formal specification and software reliability modeling, were recommended as topics for both short and long term research. N.W.

N82-24846*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMBINING ANALYSIS WITH OPTIMIZATION AT LANGLEY RESEARCH CENTER. AN EVOLUTIONARY PROCESS
James L. Rogers, Jr. Apr. 1982 11 p refs Proposed for presentation at the 2nd Intern. Computer Eng. Conf. and Show, San Diego, Calif., 15-19 Aug. 1982
(NASA-TM-84472; NAS 1.15:84472) Avail: NTIS HC A02/MF A01 CSCL 09B

The evolutionary process of combining analysis and optimization codes was traced with a view toward providing insight into the long term goal of developing the methodology for an integrated, multidisciplinary software system for the concurrent analysis and optimization of aerospace structures. It was traced along the lines of strength sizing, concurrent strength and flutter sizing, and general optimization to define a near-term goal for combining analysis and optimization codes. Development of a modular software system combining general-purpose, state-of-the-art, production-level analysis computer programs for structures, aerodynamics, and aeroelasticity with a state-of-the-art optimization program is required. Incorporation of a modular and flexible structural optimization software system into a state-of-the-art finite element analysis computer program will facilitate this effort. This effort results in the software system used that is controlled with a special-purpose language, communicates with a data management system, and is easily modified for adding new programs and capabilities. A 337 degree-of-freedom finite element model is used in verifying the accuracy of this system. M.D.K.

N82-24942*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AEROACOUSTIC PERFORMANCE OF AN EXTERNALLY BLOWN FLAP CONFIGURATION WITH SEVERAL FLAP NOISE SUPPRESSION DEVICES
Daniel J. McKinzie, Jr. May 1982 30 p refs
(NASA-TP-1995; E-573; NAS 1.60:1995) Avail: NTIS HC A03/MF A01 CSCL 20A

Small scale model acoustic experiments were conducted to measure the noise produced in the flyover and sideline planes by an engine under the wing externally blown flap configuration in its approach attitude. Broadband low frequency noise reductions as large as 9 dB were produced by reducing the separation distance between the nozzle exhaust plane and the flaps. Experiments were also conducted to determine the noise suppression effectiveness in comparison with a reference configuration of three passive types of devices that were located on the jet impingement surfaces of the reference configuration. These devices produced noise reductions that varied up to 10 dB at reduced separation distances. In addition, a qualitative estimate of the noise suppression characteristics of the separate devices was made. Finally static aerodynamic performance data were obtained to evaluate the penalties incurred by these suppression devices. The test results suggest that further parametric studies are required in order to understand more fully the noise mechanisms that are affected by the suppression devices used. M.G.

N82-24946# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
GENERATION OF NOISE BY TURBULENCE
Robert Legendre 1981 35 p refs In FRENCH; ENGLISH summary Report will also be announced as translation (ESA-TT-763)
(ONERA-P-1981-3; ISSN-0078-379X) Avail: NTIS HC A03/MF A01

The notion of noise source is elaborated, distinguishing between turbulent agitation, which is a cause, and acoustic agitation which is a minor effect or subproduct whose essential particularity is its propagation at the speed of sound. This allows for a precise definition of noise, derived from acoustic potential and apart from pseudo-noise linked to turbulence. The equation, valid for this potential, is established by an almost complete elimination of state variables and is linearized. This enables a study of convection and refraction effects and shows that generated noise is in proportion to the density relative variation rate. A model of anisotropic turbulence inside a shear flow is proposed. Its use shows that the noise generated inside a vortex tube is proportional to the square of the circulation. Application of the findings to interpretation of noise measurements in wind tunnels, e.g. aircraft noise predictions, is discussed. An extension of the method in order to include noise near obstacles is outlined. Author (ESA)

N82-25017*# National Aeronautics and Space Administration, Washington, D. C. Education Services Branch.
AEROSPACE ENGINEERS: WE'RE TOMORROW-MINDED PEOPLE
Mary H. Lewis 1981 39 p refs Original contains color illustrations
(NASA-EP-188; NAS 1.19:188) Avail: NTIS HC A03/MF A01 CSCL 05A

Brief job-related autobiographical sketches of engineers working on NASA aerospace projects are presented. Career and educational guidance is offered to students thinking about entering the aerospace field. R.J.F.

N82-25040*# Arizona Univ., Tucson. Optical Sciences Center.
TESTING OF THE KUIPER AIRBORNE OBSERVATORY 91-CM TELESCOPE Final Report
Robert E. Parks Jul. 1979 49 p refs
(Contract NAS2-10085)
(NASA-CR-166341; NAS 1.26:166341) Avail: NTIS HC A03/MF A01 CSCL 03A

The 91 cm telescope of the Kuiper Airborne Observatory was tested for optical figure errors in the surface of the mirrors and misalignment of the optical components. When the present set of optical components are installed in the telescope in proper alignment, the telescope produces an image with 80% of the energy in a circle of 1.50 arc seconds in diameter; that is, a 0.11 mm spot diameter in the focal plane. The primary mirror, an f/2 parabola, was tested against a flat and has a quality that puts 80% of the energy in a 0.51 arc second diameter spot. Two principal sources account for the residual error: the tertiary folding flat and the chopping secondary. It appears that the method of mounting the folding flat causes some distortion and that the secondary mirror has some residual spherical aberration in its figure. S.L.

N82-25170*# Grumman Aerospace Corp., Bethpage, N.Y.
STUDY OF VTOL IN GROUND-EFFECT FLOW FIELD INCLUDING TEMPERATURE EFFECT Final Report
W. G. Hill, R. C. Jenkins, S. G. Kalemaris, and M. J. Siclari Apr. 1982 179 p refs
(Contract NAS2-10645)
(NASA-CR-166258; NAS 1.26:166258) Avail: NTIS HC A09/MF A01 CSCL 01A

Detailed pressure, temperature, and velocity data were obtained for twin-fan configurations in-ground-effect and flow models to aid in predicting pressures and upwash forces on aircraft surfaces were developed. For the basic experiments, 49.5 mm-diameter jets were used, oriented normal to a simulated round plane, with pressurized, heated air providing a jet. The experimental data consisted of: (1) the effect of jet height and temperature on the ground, model, and upwash pressures, and temperatures, (2) the effect of simulated aircraft surfaces on the isolated flow field, (3) the jet-induced forces on a three-dimensional body with various strakes, (4) the effects of non-uniform coannular jets. For the uniform circular jets, temperature was varied from room temperature (24 C) to 232 C. Jet total pressure was varied between 9,300 Pascals and 31,500 Pascals. For the coannular jets, intended to represent turbofan engines, fan temperature was maintained at room temperature while core temperature was varied from room temperature to 437 C. Results are presented. B.W.

N82-25171# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugfuehrung.
PROCEEDINGS OF THE 11TH SYMPOSIUM ON AIRCRAFT INTEGRATED DATA SYSTEMS
Nov. 1981 454 p refs Symp. held at Cologne, 22-24 Sep. 1981
(DFVLR-Mitt-82-02) Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The acquisition and processing of in-flight data are discussed. Flight recorder design and usefulness; cost benefits of improved data systems; trends in data system engineering are considered. Aircraft accident investigation and maintenance as well as engine monitoring are covered. For individual titles, see N82-25172 through N82-25189.

N82-25172# Sperry Univac, St. Paul, Minn.
SOLID-STATE FLIGHT INCIDENT RECORDER
D. Amundson *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 17-31 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

A deployable flight incident recorder based on MNOS technology, suitable for fighter aircraft, is described. Capable of recording 30 min of digital and 15 min of audio information, the equipment weighs 3.5 lbs and dissipates 3.5 W. Flight and crash tests show that it is more reliable than tape recorders, and improves access times a million-fold. If audio is not required, engine monitoring, aircraft fatigue recording and program storage for onboard computers are possible. Author (ESA)

N82-25173# Hamilton Standard, Windsor Locks, Conn.
SOLID STATE CRASH SURVIVABLE FLIGHT DATA RECORDERS FOR MISHAP INVESTIGATION
H. R. Ask *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 33-68 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The state of the art in solid state memories, microprocessors and crash survival is reviewed. Flight recorders for small and large civil transport aircraft are described. Heat flow problems with crash survivable designs are solved, using an intumescent outer layer for the enclosure. This provides heat absorbtion during a phase change, followed by creation of a passive insulation layer formed by the charred residue. An aluminum alloy housing under the intumescent layer is the primary rigid structure for penetration, shock and static crush resistance. The small aircraft system has a 131 kbit memory, providing 30 min of prior flight data with > 100% reserve, using data compression. It protects airborne and on ground signal goodness data and is nondeployable. The large aircraft system stores the 21 min of raw input data and the last 15 hr of data in memory with data compression possible. It protects in memory two flight cycles of any duration, with total elapsed time > 25 hr possible. Author (ESA)

N82-25174# Sundstrand Data Control, Inc., Redmond, Wash.
NEW TECHNIQUES IN DATA RETRIEVAL AND DISPLAY

G. S. L. Benn *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 69-91 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The contribution of multicolor graphics to the display and interpretation of aircraft data from digital flight data recorders is described. Video graphic techniques for improving the speed of data interpretation and methods that allow rapid quick look selected data are compared with previous methods. For a noncrash incident, a two page printout of relevant parameters, photographs via the screen print of the last hour of flight together with zoomed detail of the incident, and a permanent record of flight data are available in < one hour. Quick look capability is ensured by electronic scrolling of graphed data coupled with direct conversion of digital data to engineering units. Author (ESA)

N82-25175# Eurocontrol Agency, Brussels (Belgium).
ON-LINE EXPERIMENTS IN ACQUIRING AND EXPLOITING AIDS DATA FOR ATC PURPOSES
M. E. Cox *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 93-114 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Problems in acquiring real time data from aircraft integrated data systems are discussed. The experimental evaluation of AIDS data applications and investigation of a functional system are described. Flight tests indicate that the acquisition of aircraft data via a selectively addressed secondary surveillance radar mode S transponder is straightforward if an ARINC 429 Mk 33 digital information transfer system interface is available. Author (ESA)

N82-25176# Vereinigung Cockpit, Frankfurt am Main (West Germany).
A PILOT'S VIEW ON POSSIBLE USES OF AIDS
Christian Denke *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 125-130

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Problems with the U.S. beacon collision avoidance system and the Eurocontrol - DFVLR airborne link terminal are highlighted. The U.S. system cannot handle a large number of aircraft, and resolves encounters through distance and flight level, with no reference to relative position. Avoidance maneuvers are only possible in the vertical plane. The avoidance maneuver logic has not been proven capable of accounting for individual aircraft performance. The European system substitutes visual messages for voice communication, increasing the already considerable visual workload. Its insistence on rigidly adhering to flight plans (as an aid to strategic ATC) increases fuel costs. Author (ESA)

N82-25177# Sundstrand Data Control, Inc., Redmond, Wash.
A NEW ALL-PURPOSE DIGITAL FLIGHT DATA RECORDER
P. H. Esson *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 131-158 ref

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

A recorder which can be installed interchangeably in ARINC 542 or ARINC 573/717 equipped aircraft features a coplanar, peripheral belt driven magnetic tape transport containing 450 ft of 1/4 in tape. Two interleaved 4-channel read/write heads and two erase heads are incorporated. A 7.5 deg external drive step motor operating in a slew mode drives the tape at 6 ips. The electronics cards are standard plug in boards containing: read/write, transport, data acquisition data acquisition expansion, and aircraft wiring interfaces; as well as the recording system and data acquisition controllers. The built in test capability exceeds 95% fault detection. Author (ESA)

N82-25178# Air Navigation Services, Inc., Westerngrund (West Germany). Advisory Group.
AERONAUTICAL INFORMATION DATA SUBSYSTEMS

Frank W. Fischer *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 159-184 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The case for reorganizing aeronautical information processing is argued. Air traffic controllers need access to correct, current, definitive data on activity in their area. Since they have to make real time decisions, systems must provide information in a rapidly assimilable and retransmissible form. A centralized data source is required to preprocess data. Author (ESA)

N82-25179# Dayton Univ., Ohio. Research Inst.
THE EFFECT OF VERY HEAVY RAIN UPON AIRCRAFT AND ITS ROLE IN WIND SHEAR ATTRIBUTED ACCIDENTS

P. A. Haines and J. K. Luers *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 185-215 refs
Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

and (5) the conditions in India. Suggestions are made to prevent bird visits to the airport area. E.A.K.

N82-26185# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

LA RECHERCHE AEROSPATIALE, BI-MONTHLY BULLETIN, NUMBER 1981-6, NOVEMBER-DECEMBER 1981

Claude Sevestre, ed. Paris ESA Mar. 1982 72 p refs Transl. by ONERA into ENGLISH from 'La Rech. Aerospatiale, Bull. Bimestriel (Paris) No. 1981-6, Nov.-Dec. 1981' Sponsored by ESA

(ESA-TT-741) Avail: NTIS HC A04/MF A01; original report in FRENCH available at ONERA, Paris FF 55

The interaction of an oblique jet with a subsonic flow was studied. Aerodynamic flow measurement, using fluorescence and laser Doppler velocimetry are discussed. Fatigue crack propagation, and subsonic flutter of compressor blades were examined. Approximate compressibility relations and Euler equations of motion are treated. An implicit pseudo unsteady calculation method for transonic flow is presented.

N82-26189# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

AEROELASTICY OF COMPRESSOR BLADES: SUBSONIC STALL FLUTTER

H. Loiseau and E. Szechenyi *In its* La Rech. Aerospatiale, Bi-monthly Bull. No. 1981-6, Nov.-Dec. 1981 (ESA-TT-741) Mar. 1982 p 47-59 refs Transl. by ONERA into ENGLISH from 'La Rech. Aerospatiale, Bull. Bimestriel (Paris) No. 1981-6, Nov.-Dec. 1981'

Avail: NTIS HC A04/MF A01; original report in FRENCH available at ONERA, Paris FF 55

The aeroelasticity of turbomachine blades, of cascade wind tunnel and performance tests, were analyzed. Wind tunnel tests involved excitation by hydraulic actuators and pressure transducer measurements. It is found that unsteady pressures causing stall flutter are located on the upper surface, principally in the operating domains where flow is completely separated, while instability is principally a function of the angle of attack. The phase lag of unsteady pressures increases with vibration frequency. When it is sufficiently large, the flutter disappears, even under suitable separation conditions. Unsteady lift and moment, induced by a vibratory pitching movement around any axis are obtained by linear superposition of forces due to heaving and a pitching movement around a given reference axis. The wind tunnel simulated closely compressor flows with good periodicities in five interblade channels. Author (ESA)

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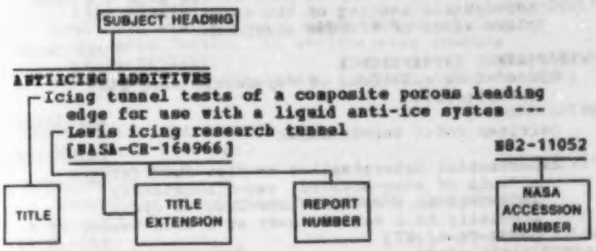
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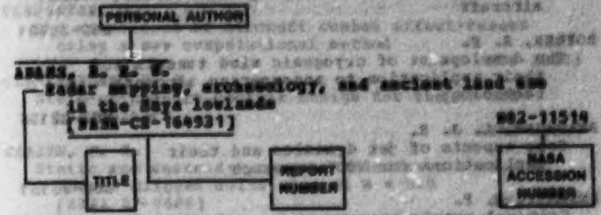

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June 7-11, 1982, AIAA Paper 82-0935. 14 p. 23 refs. Research supported by the Nederlands Instituut voor Vliegtuigontwikkeling en Ruimtevaart.

A computer program system used for the prediction of aircraft steady aerodynamic characteristics is presented for simulating body and fillet effects in a wing-alone code. The computational aerodynamic information system XFLO22NLR contains a geometry processor, a modified transonic flow analysis code FLO22, simulating body influence, the subsonic Panel method, the three-dimensional laminar-turbulent boundary layer code BOLA, and the post-processing system EDIPAS. The system can predict gross values of lift, pitching moment and drag of wing-body configurations, and can provide information with respect to individual drag components, pressure distributions and boundary layer quantities. Capabilities of the system are demonstrated for various transport-type wing-body configurations. D.L.G.

A82-31923 # **The equivalent simple body /ESB/ method for transonic wing analysis.** P. J. O. Neil and A. Verhoff (McDonnell Aircraft Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0936.* 12 p. 10 refs. Research supported by the McDonnell Douglas Independent Research and Development Program.

A procedure is presented for generating an Equivalent Simple Body (ESB) which simulates the wing/fuselage interaction of a complex fighter-type fuselage. The method is used in conjunction with state-of-the-art transonic, potential flow codes, which are limited in their ability to generate computational grids about complex fuselage geometries. The ESB representation is determined at a subcritical Mach number using the precise geometric modelling capabilities of a panel method. Mach number independence of the interaction is established for small angles of attack, thus allowing for accurate computation of wing pressures with the transonic codes. Results are shown for F-15, F/A-18, and AV-8B geometries. (Author)

A82-31932 # **A high-frequency transonic small disturbance code for unsteady flows in a cascade.** G. D. Kerlick and D. Nixon (Nielsen Engineering and Research, Inc., Mountain View, CA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0955.* 8 p. 10 refs. Contract No. N00019-81-0169.

A high-frequency version of the Ballhaus-Goorjian (1977) code LTRAN2 has been adapted to represent unsteady aerodynamic phenomena in transonic cascade flow. The modifications to the algorithm for high frequencies differ from those of Rizzetta and Chin (1979) in two ways: first, a second-order difference for the velocity potential term instead of a first order one is used, and second, a wake condition derived for the transonic small disturbance equation is applied. Then, in order to represent the cascade geometry, periodic boundary conditions and periodic tridiagonal solvers must be introduced. Examples of both oscillatory flows and indicial responses are presented. Application of the indicial method to unsteady cascades is discussed. Future work on the code will extend the applicability of the code to staggered, highly cambered cascades. (Author)

A82-31933 * # **Finite volume calculation of three-dimensional potential flow around a propeller.** W.-H. Jou (Flow Industries, Inc., Kent, WA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0957.* 7 p. 10 refs. Contract No. NAS3-22148.

The finite volume scheme of Jameson (1977) is used to calculate potential flow around a propeller rotating at high speed. An H-type mesh is generated and used successfully in the calculations. A test calculation with a thick blade cross section shows that the present code is capable of computing the propeller flow at the advance Mach number 0.8. The possible physical mechanisms which may play an important role in the propeller aerodynamics are discussed. V.L.

A82-31934 # **Calculation of the flow-field velocities of a wing-body-stores combination in transonic flow.** S. N. Chaudhuri, C. Balasubramanyan (Tennessee, University, Tullahoma, TN), and P. Sundaram. *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0958.* 7 p. 12 refs. Contract No. F08635-80-C-0088.

An integral equation method developed by Oswatitsch et al (1950, 1955) is extended to calculate the flow-field perturbation velocity components for various wing-body-pylon-external store configurations in the lateral and transverse directions. The computed flow field velocities are found to be in reasonably good agreement with pressure probe and laser Doppler velocimetry data at different Mach numbers and angles of attack for regions where strong viscous effects are absent. The method can be further extended to more complicated geometries such as multiple stores and engine intakes at both subsonic and supersonic free-stream Mach numbers. V.L.

A82-31935 * # **Evaluation of two analytical methods for the prediction of inlet flow fields in the vicinity of generalized forebodies.** S. F. Yaros (NASA, Langley Research Center, Transonic Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0959.* 11 p. 16 refs.

An investigation of the capability of two computer programs to simulate transonic and supersonic flows about representative fighter aircraft forebodies has been carried out for purpose of predicting flow fields in the vicinity of typical inlet locations. Each computer program is described as to its features and usage, and results are compared with comprehensive wind tunnel data. Although both computer codes were inviscid, results show that the gross aerodynamic effects of the forebody, with and without a wing, can be simulated fairly well. Further work is needed to include the effects of viscosity including vortex shedding. (Author)

A82-31944 # **Hypersonic interactions with surface mass transfer. I - Steady flow over a slender wedge wing.** R. N. Gupta, N. K. Varghese (M.A. College of Engineering, Kerala, India), C. M. Rodkiewicz (Alberta, University, Edmonton, Canada), and A. C. Jain (Indian Institute of Technology, Kanpur, India). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0979.* 30 p. 32 refs.

The steady hypersonic interaction problem with air, argon, and helium injection is analyzed. A complete solution has been obtained for the basically nonsimilar problem of a slender wedge wing at an angle of attack. In the analysis presented here, a series solution has been developed to specify the initial condition close to the leading edge and the numerical integration is carried out downstream of this line for all the regions from strong to weak interactions including the transition. The numerical solutions have been obtained by the 'difference-differential' technique as well as by a finite-difference method. The comparative advantages and disadvantages of the two methods are discussed. The obtained results include the lift and drag coefficients, the lift to drag ratio, the position of the aerodynamic center, and the heat transfer rate per unit width of the wedge wing. A lighter gas like helium may be less appealing as a coolant due to the large induced pressures. (Author)

A82-31954 * # **Subsonic 3-D surface panel method for rapid analysis of multiple geometry perturbations.** D. R. Bristow, J. D. Hawk (McDonnell Aircraft Co., St. Louis, MO), and J. L. Thomas (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0993.* 12 p. 12 refs.

For any baseline aircraft configuration, a matrix of partial derivatives of surface velocity potential with respect to geometry coordinates is calculated. Linear extrapolation is then used to analyze the subcritical potential flow corresponding to a series of arbitrary small geometry perturbations. Each perturbation analysis is more than an order of magnitude more efficient than a conventional panel method solution because no influence coefficients are calculated and no large system of linear algebraic equations is solved. Wing and wing-fuselage examples are presented to demonstrate that the predicted pressure distributions are nearly exact for large changes to wing camber, thickness, and leading edge radius. (Author)

A82-31957 # **Calculations of viscous transonic flow over aerofoils.** Z. B. Chen and P. Bradshaw (Imperial College of Science and Technology, London, England). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0997.* 7 p. 9 refs.

A simple and economic iterative scheme is presented for calculating compressible viscous boundary layers and wakes over aerofoils, and for matching the shear layer calculations to the calculations of the transonic potential external flows. The iterative scheme is an extension and improvement of the scheme developed by Mahgoub and Bradshaw for calculating incompressible flow. A new iterative method in the shear layer calculations has been designed and applied in the near wake region. The computing time is only a little greater than in conventional displacement-surface calculations that ignore normal pressure gradients and consequently incur errors in the near wake. Some comparisons are made with full Navier-Stokes solutions and experimental data. (Author)

A82-31958 # **A numerical study of the turbulent flow past an isolated airfoil with trailing edge separation.** C. M. Rhie (Ford Motor Co., Detroit Diesel Allison Div., Indianapolis, IN) and W. L. Chow (Illinois, University, Urbana, IL). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0998.* 12 p. 20 refs. Grant No. DAAG29-79-C-184.

A finite volume numerical method is presented for the solution of the two-dimensional, incompressible, steady Navier-Stokes equations in general curvilinear coordinates. This method is applied to the turbulent flows over isolated airfoils with and without trailing edge separation. The standard K-epsilon model is utilized to describe Reynolds stresses. Body-fitted coordinates are generated for the computation. The solution method is an extension of the procedure developed by Gosman and Pun (1973). The performance of the K-epsilon model is assessed by comparing the predictions with the available experimental data. (Author)

A82-31960 * # **Numerical investigation of supersonic base flow with parallel injection.** G. A. Sullins (Johns Hopkins University, Applied Physics Laboratory, Laurel, MD), J. D. Anderson, Jr. (Maryland, University, College Park, MD), and J. P. Drummond (NASA, Langley Research Center, Computational Methods Branch, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1001.* 10 p. 11 refs. Research supported by the University of Maryland; Grant No. NCC1-41.

The present investigation represents the first detailed numerical calculations of base flow with gas injection using a geometry and primary flow condition germane to a scramjet combustor. The investigation is concerned with the numerical solution of the complete two-dimensional Navier-Stokes equations for the flowfield in the vicinity of the base with parallel gas injection, taking into account the fluid dynamic aspects of this flowfield. The flow is dominated by separation, and by mixed regions of locally subsonic and supersonic flow. A comparison is conducted of flows with and without injection, and the effect of base injection on the wave patterns and shear layers of such flows is clearly established. G.R.

A82-31965 * # **Three dimensional turbulent boundary layer development on a fan rotor blade.** B. Lakshminarayana, C. Hah, and T. R. Govindan (Pennsylvania State University, University Park, PA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1007.* 10 p. 12 refs. Grant No. NsG-3266.

This paper is concerned with an experimental study undertaken to measure the boundary layer growth on a fan rotor blade. The measurements were carried out using a miniature 'X' configuration hot wire probe at various chordwise and radial locations on both surfaces of the blade. The streamwise and radial velocity profiles as well as the corresponding intensity components are interpreted and correlated. The validity of conventional velocity profiles such as the 'law of the wall' for the streamwise profile and the hodograph plot for the cross flow profile are examined. The measured values of boundary-layer gross properties are compared with the predictions based on a momentum-integral technique. (Author)

A82-31972 # **Design of finite element grids for the computation of the three-dimensional transonic flow around a wing.** A. Ecer, E. Citipitioglu, and B. A. Bhutta (Purdue University, Indianapolis, IN). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1019.* 11 p. 14 refs. Grant No. AF-AFOSR-80-0258.

The solution of the three-dimensional, transonic, potential flow equations using the finite element method is presented for the case of flow around a wing. Numerical results obtained for different computational grids are compared for studying the efficiency and accuracy of the solution as related to the choice of the computational grid. A finite element mesh generation scheme is presented which was developed for designing proper computational grids for the solution of transonic flows around three-dimensional bodies with complex geometries. The utilization of higher-order elements and their implementation in this new mesh generation technique is discussed. Also, the application of a new iterative, element based finite element solver for transonic flows is introduced. (Author)

A82-31974 * # **Prediction of separated asymmetric trailing-edge flows at transonic Mach numbers.** C. C. Horstman (NASA, Ames Research Center, Experimental Fluid Dynamics Branch, Moffett Field, CA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1021.* 13 p. 17 refs.

Numerical simulations of the time-dependent, Reynolds averaged, Navier-Stokes equations, employing various eddy viscosity turbulence models, are presented and compared with measurements from an investigation of a transonic trailing-edge flow at a high Reynolds number. Comparisons are made for mean surface quantities as well as mean and fluctuating flow-field quantities. Solutions employing two-equation turbulence models correctly predict all the major features of the flow field. Viscous-inviscid interaction effects were found to be extremely important for predicting this flow field and equally important to the turbulence modeling employed. (Author)

A82-31978 # **A vortex sheet method for calculating separated two-dimensional flows at high Reynolds number.** M. Ribaut (Brown Boveri et Cie. AG, Baden, Switzerland). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1030.* 9 p. 12 refs.

A mixed boundary condition problem for the time-averaged separated flow of a compressible and viscous fluid at high Reynolds number is formulated and solved by means of vortex and source integral equations. Application of the method to the flows past a flat plate and a blunt-trailing-edge section has shown that the extension and underpressure of the calculated wakes directly depend on the amount of vorticity diffusion and dissipation occurring in the flow. Computed velocity distributions and wake underpressures are compared with the experiment. (Author)

A82-31979 # **Very large aircraft - A common response to a rapidly changing global environment.** C. Dornier, Jr. (Dornier GmbH, Friedrichshafen, West Germany). *American Institute of Aeronautics and Astronautics, International Very Large Vehicles Conference, 2nd, Washington, DC, May 17, 18, 1982, Paper 82-0799.* 6 p.

out for an isolated V-shaped delta wing of negligible thickness in terms of slender body theory, which allowed the three-dimensional problem of detached flow to be reduced to the unsteady two-dimensional problem of detached flow around a widening V-shaped plate. Lift coefficients derived from the calculations and from pressure measurements show a maximum at negative dihedral angles, indicating that the parachute effect is a consequence of nonlinear effects arising from flow separation from the lateral edges of the wing. A.L.W.

A82-34144 † Development of a control law for the alleviation of maneuver loads on an elastic aircraft (Postroenie zakona upravleniia dlia snizheniia manevrennykh nagruzok na uprugom samolete). F. Z. Ishmuratov and V. N. Popovskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 156-161. 5 refs. In Russian.

A mathematical model for the longitudinal maneuver of an elastic aircraft is used to develop an active control system for the reduction of maneuver loads. This rather general model makes it possible to investigate the interaction of the active control system with the motion of the aircraft (as a rigid body) and with elastic deformations of the structure under large disturbances. As an example, this approach is used to investigate the longitudinal maneuver of a heavy passenger aircraft with swept wings of large aspect ratio. B.J.

A82-34145 † Structural optimization of a swept wing on the basis of the aileron efficiency condition (Optimizatsiia konstruktsii strelovidnogo kryla iz usloviia effektivnosti eleronov). V. I. Biriuk, A. V. Sharaniuk, and Iu. F. Iaremchuk. *TsAGI, Uchenye Zapiski,* vol. 12, no. 4, 1981, p. 162-166. 5 refs. In Russian.

The paper considers the maximization of the aileron efficiency of a swept wing of large aspect ratio and specified weight by means of the optimization of the distribution of stiffness characteristics. The wing is modeled as a beam, and constraints imposed on the stiffness characteristics are taken into account. It is shown that an increase of approximately 20% can be obtained in the aileron efficiency by optimization of the stiffness distribution (the initial weight being preserved). B.J.

A82-34149 † An experimental study at free-stream Mach 5 of the aerodynamic heating of the upper surface of plane wings of various planforms (Eksperimental'noe issledovanie pri chisle M sub infinity 5 aerodinamicheskogo nagrevaniia verkhnei poverkhnosti ploskikh kryl'ev razlichnoi formy v plane). N. A. Kovaleva and A. Ia. Iushin. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 23-32. 14 refs. In Russian.

Heat transfer at the upper surface of the wing has been investigated for plane wings of seven different planforms at a free-stream Mach number of 5, with angles of attack varying from 0 to 15 degrees. A Reynolds number of (1.7-2.5) x 10 to the 6th has been computed from incoming free-stream flow parameters and the model length. Heat transfer at the upper wing surface is found to be strongly dependent on the shape of the wing leading edge. V.L.

A82-34154 † Determination of the glide path of an aircraft with power off (Opredelenie oblasti dostizhimosti letatel'nogo apparata bez tiagi). G. V. Parysheva, S. A. Smirnov, and V. A. Iaroshevskii. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 72-83. In Russian.

The glide path of an aircraft controlled by varying the angle of roll is analyzed in terms of a quasi-stationary gliding hypothesis. The Pontryagin maximum principle is used to determine the angle-of-roll control structure at trajectories corresponding to the glide path boundaries, and a classification of such trajectories is proposed. Glide paths are plotted for an aircraft as a function of its maneuvering capabilities, i.e., the available distance and the available angle of turn. V.L.

A82-34157 † Hysteresis of the normal force of a wing of complex planform under unsteady motion (Gisterezis normal'noi sily kryla slozhnoi formy v plane pri neustanovivshemsia dvizhenii). A. N. Zhuk, A. I. Kur'ianov, and G. I. Stoliarov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 113-118. In Russian.

The effect of unsteady motion on the normal force of an aircraft having a wing of complex planform has been investigated at subsonic velocities. It is found that noticeable transformation of aerodynamic characteristics occurs, in relation to angles of attack, at separation regimes in the case of unsteady motion. It is also found that the hysteresis loop in the normal force vs angle of attack relationship widens with the angular frequency of oscillations. This effect is attributed to transformations in the unstable vortex structure of flows at large angles of attack and to the irreversibility of viscous separated flows. V.L.

A82-34161 † An algorithm for calculating the compliance matrices of aircraft structures by the substructure method as applied to aeroelasticity problems (Algoritm rascheta matrits podatlivosti konstruktsii letatel'nykh apparatov metodom podkonstruktsii primenitel'no k zadacham aerouprugosti). D. D. Evseev and A. A. Rybakov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 139-142. In Russian.

An algorithm based on a polynomial method is proposed for determining the compliance matrices of aircraft structures. An aircraft is represented as a set of flexible substructures (wing, fuselage, controls, and suspensions) with independent sets of coordinate functions used for specifying substructure deformations. Coupling between the substructures is realized by means of discrete springs simulating actual connections between structural elements. V.L.

A82-34162 † Method for the measurement of elastic deformations of aircraft models in a wind tunnel (Sposob izmereniia uprugikh deformatsii modeli samoleta v aerodinamicheskoi trube). M. V. Ushakov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 143-147. 8 refs. In Russian.

The measurement of the surface deformations of an aircraft model in a wind tunnel flow by a remote optical method is presented. A series of mirrors was attached flush with the wing and elevon surfaces of the model at 59 separate points, and illuminated with laser light which was subsequently reflected onto a screen. Chordwise and spanwise deformations were calculated from the differences of the positions of reflected spots for the situations of deflected and nondeflected control surfaces at an angle of attack of zero and Mach number of 2. Experimental measurements of the angle of deformation are observed to be in good agreement with those calculated from piston theory, supporting the applicability of the optical method in similar experiments. A.L.W.

A82-34163 † Instability effects on pylon and engine loading in an aircraft with high-aspect-ratio wings (Vliianie nestatsionarnosti na nagruzhenie pilonov i dvigatelei samoleta s krylom bol'shogo udlineniia). G. I. Turchannikov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 5, 1981, p. 148-152. In Russian.

Consideration is given to the problem of the dynamic loading of the pylons and engines of an aircraft with high-aspect-ratio wings flying in the turbulent atmosphere. In contrast to previous analyses based on a quasi-steady approach to the determination of the aerodynamic forces acting on an elastically deforming aircraft flying in the downwash field of a harmonic gust, the present analysis takes into account the unsteady variations in aerodynamic forces. Results of calculations of dynamic loading are presented for a heavy transport aircraft with two engines under each wing flying at an altitude of 6 km at Mach 0.77 with normal loading. It is noted that the present method results in the reduction of calculated pylon loadings to a level acceptable for maintaining static stability. A.L.W.

A82-34166 † Transonic flow past bodies of the type wing-fuselage with allowance for boundary effects (Transzvukovoe obtekanie tel tipa krylo-fiuzeliazh s uchetom vliianiia granits potoka). I. V. Tret'iakova and A. S. Fonarev. *TsAGI, Uchenye Zapiski,* vol. 12, no. 6, 1981, p. 9-15. 8 refs. In Russian.

Transonic flow past bodies of the type wing-fuselage is analyzed in the case of unbounded flow and in the case of gas flow inside a cylindrical wind tunnel with permeable boundaries. A numerical analysis is used to determine the effect of the walls of the wind tunnel test section on flow past the model. It is shown that the effect of the walls on flow past the model can be significantly reduced by adjusting pressure in the wind tunnel external chamber. V.L.

A82-34172 † Solution of creep problems by a finite element method (Reshenie zadach polzuchesti metodom konechnykh elementov). G. N. Zamula and V. A. Pavlov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 6, 1981, p. 87-97. 5 refs. In Russian.

A method and a computation algorithm based on the use of finite elements are used to analyze the stress-strain state of thin-walled aircraft structures. The method and the algorithm, implemented in a computer program, are tested on several problems including a problem concerning thermal relaxation in a stiffened plate which has exact (viscoelasticity case) and numerical (nonlinear creep) solutions. In both cases, the results obtained are in good agreement with those reported by other workers. V.L.

A82-34177 † A method of accounting for the effect of aircraft deformations on its loading (Metod ucheta vliianiia deformatsii samoleta na ego nagruzhenie). V. Ia. Mitrushchenkov. *TsAGI, Uchenye Zapiski,* vol. 12, no. 6, 1981, p. 124-130. 5 refs. In Russian.

A method is proposed for solving static aeroelasticity problems whereby structure deformation is expanded in terms of deformation forms obtained by the method of successive approximations. The convergence of the method is analyzed with reference to a problem concerning the loading and stress-strain state of an aircraft structure with allowance for the effect of deformations on aerodynamic force distribution. Numerical results are presented. V.L.

A82-34359 * Linear decentralized systems with special structure. C. F. Martin (Case Western Reserve University, Cleveland, OH). *International Journal of Control,* vol. 35, Feb. 1982, p. 291-308. 5 refs. Grants No. NsG-2384; No. NAG2-82; Contracts No. N00014-80-C-0199; No. DE-AC01-80RA-5256.

Certain fundamental structures associated with linear systems having internal symmetries are outlined. It is shown that the theory of finite-dimensional algebras and their representations are closely related to such systems. It is also demonstrated that certain problems in the decentralized control of symmetric systems are equivalent to long-standing problems of linear systems theory. Even though the structure imposed arose in considering the problems of twin-lift helicopters, any large system composed of several identical intercoupled control systems can be modeled by a linear system that satisfies the constraints imposed. Internal symmetry can be exploited to yield new system-theoretic invariants and a better understanding of the way in which the underlying structure affects overall system performance. C.R.

A82-34373 # Electro-hydraulic nose wheel steering of the Dornier 228. *Dornier-Post* (English Edition), no. 2, 1982, p. 60, 61.

The construction, control, and electronics for the electrohydraulic nose wheel steering of the Dornier 228 aircraft are described. The pilot steers with pressure on the pedal, which changes the rudder position at the same time. The alteration of pedal position initiates voltage signals from a command potentiometer, signals which move into a servo-channel and a monitor channel. Actual nose wheel deflections are recorded by a feedback sensor for comparison between input and output signals. Steering is limited to 18 deg/sec with maximum deflection set at 45 deg either way during taxiing, 8 deg during take-off, and 0 deg during take-off and landing. An error threshold is included in the control logic, resulting in steering actuator deactivation if the difference between command and feedback signals exceeds the specified level. M.S.K.

A82-34374 # OLGA - A gust alleviation for general aviation aircraft. H. B]hret. *Dornier-Post* (English Edition), no. 2, 1982, p. 62-64.

Open-loop gust alleviation (OLGA) is described as a method of avoiding the 0.3 Hz gust induced vibrations which are associated with the maximum occurrences of airsickness, particularly in low-flying, short haul aircraft. Closed-loop systems measure the magnitude of response to gusts and change control surface configurations to compensate. This is noted to cause sluggish response to pilot commands by altering the flight characteristics. In the new technology wing program, symmetrical aileron deflection and horizontal stabilizer changes are actuated from signals generated by a digital control unit which senses the gust angle of attack, then commands compensatory action. The pilot has complete override control. Block diagrams are provided of the control circuitry, and it is shown that OLGA can produce approximately 75% gust alleviation in the ranges 0.3-0.9 Hz. M.S.K.

A82-34397 On the torsional modes of a uniformly tapered solid wing. E. H. Mansfield (Royal Aircraft Establishment, Farnborough, Hants., England). *Aeronautical Quarterly*, vol. 33, May 1982, p. 154-173.

An exact analysis is first given, within the spirit of elementary theory, of the torsional modes of a uniformly tapered solid wing whose section shape - as distinct from size - is constant. Numerical results are presented for the first five torsional modes for various values of tip chord/root chord. It is shown that the frequencies are fairly insensitive to the magnitude of the taper, and a corollary to this, which is also investigated, is that an analysis based on a partially stepped representation of the taper yields close estimates of the frequencies but can yield massive differences in the higher mode shapes. An analysis is also made of warping restraint and distributed inertia effects. (Author)

A82-34398 Turbulent boundary-layer development on a two-dimensional aerofoil with supercritical flow at low Reynolds number. C. J. Baker and L. C. Squire (Cambridge University, Cambridge, England). *Aeronautical Quarterly*, vol. 33, May 1982, p. 174-198. 15 refs. Research supported by Rolls-Royce, Ltd.

Measurements of boundary-layer development on a small two-dimensional airfoil at turbomachinery scale Reynolds numbers with turbomachinery-type pressure distributions, supercritical flow and a weak shock front are presented in addition to measurements on the tunnel side wall opposite the airfoil surface. Three boundary-layer calculation methods are considered, and none are regarded as adequate for predicting all regions of boundary-layer development on both the airfoil surface and tunnel. The lag-entrainment method of Green et al. (1973) however, is satisfactory for most purposes on the airfoil. Experimental results are compared with those results from several calculation methods. D.L.G.

A82-34464 † Automation of the synthesis of control in a stationary linear system (Avtomatizatsiia sinteza upravleniia v statsionarnoi lineinoi sisteme). V. L. Zagaichuk. *Priborostroenie*, vol. 25, Apr. 1982, p. 21-24. 5 refs. In Russian.

A method for determining the feedback law for the accuracy optimization of a stationary linear system is presented. A block-diagram for the digital-computer calculation of the parameters of the corresponding optimal controller is presented, and application to a particular case of aircraft flight control is considered as an example. B.J.

A82-34486 Unistructure - A new concept for light weight integrally stiffened skin structure. D. J. Brimm (Chem-Tronics, Inc., El Cajon, CA). *Aircraft Engineering*, vol. 54, Apr. 1982, p. 2-6.

Unistructure is a new concept for lightweight integral rib-reinforced skin structures that is readily adaptable to many configurations. The rib cross sections are a form of I beam. The rib reinforcing patterns considered here are isogrid and waffle, (i.e. triangular and rectangular constructions) but any desirable form can be produced. This paper provides an over-view of the methods of fabrication and the structural performance features of Unistructure. Comparisons are made with honeycomb, skin/stringer, and integral-machined structures. These comparisons indicate that the combined ease-of-fabrication and performance advantages of Unistructure warrant its consideration in many applications. (Author)

A82-34491 # Trends in structural analysis at ONERA (Tendances actuelles en calcul des structures à l'ONERA). R. Valid (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Journées sur les Tendances Actuelles en Calcul de Structures, 2nd, Sophia-Antipolis, Alpes-Maritimes, France, Feb. 1-3, 1982.) ONERA, TP* no. 1982-2, 1982. 46 p. 100 refs. In French.

Research directions for modeling phenomena of structural interactions, fluid-structure interactions, the behavior of composite structures, and in aerospace structures are discussed. Increasingly precise predictions are necessary for successful numerical simulation of stress cracking, impact damage, wing-flow interactions, elastoacoustic resonance, aeroelastic optimization, hydroelasticity, the elimination of the pogo effect, elasto-capillarity in orbiting spacecraft, trajectory deformation, the homogeneity of stiffened structures, etc. Analytical tools in the process of development comprise applications of variational principles and their coupling in static and dynamic situations, finite element modeling of multilayered composites under displacement, and isoparametric finite elements for composites with layers under rotation. Variational formulations and symmetric operators are employed in hydroelastic, elastoacoustic, and elasto-capillarity, particularly in coupling modes. M.S.K.

A82-34493 # Flow visualization techniques for the study of high incidence aerodynamics. H. Werlé (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Lecture Series on Study of High Incidence Aerodynamics, 121st, Rhode-Saint-Genèse, Belgium, Mar. 15-19, 1982, Hampton, VA, Mar. 10, 11, 1982, Gottingen, West Germany, Mar. 22-26, 1982.) ONERA, TP* no. 1982-5, 1982. 28 p. 77 refs.

Descriptions are given of the use of solid, liquid or gas tracers in water and wind tunnels for the visualization of aerodynamic flows, with emphasis on the methods employed by the experimental facilities of ONERA. The range of visualization techniques covered reveal flow patterns with all their parietal singularities, as well as the evolution of such patterns as a function of such aerodynamic parameters as incidence, yaw angle and Reynolds number. Visualization methods also reveal the separation phenomena which characterize high incidence angle aerodynamics, and they precisely define vortical, transitional and unsteady flow regimes. The aerodynamic surfaces tested by visualization methods include airfoil profiles, sweptback wings, slender bodies, inlets, and entire aircraft configurations. Attention is given the layout of ONERA and other water tunnel facilities. O.C.

A82-34495 # Instrumentation for testing aircraft antistatic protection. J. Taillet, J. L. Boulay, and M. Chalanier (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(International Aerospace Conference on Lightning and Static Electricity, Oxford University, Oxford, England, Mar. 23-25, 1982.) ONERA, TP* no. 1982-7, 1982. 11 p. 11 refs. Research supported by the Direction des Recherches, Etudes et Techniques.

Methods and standards relating to aircraft protection against precipitation statics are discussed, and two instruments, the INJECO and CORAS, are presented. Engineering tests are performed with the instruments to facilitate the solution of problems encountered by manufacturers and airlines with precipitation statics. An advantage of INJECO is the assessment of noise produced by local discharges following charge accumulation on insulating surfaces. Synchronous detection with the CORAS device permits the measurement of relatively small voltage drops along the resistive layer in the presence of the large capacitive voltage drop across the insulating coating. When CORAS is used on DC modes, its operation is conventional and is useful in resistive coating processing to compare DC and AC surface resistance measurements. D.L.G.

A82-34497 # Comparison of aerodynamic characteristics of aircraft models with forward and aft swept wings at Mach number 0.5. O. du Boucheron and Y. Brocard (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(University of Bristol and Royal Aeronautical Society, International Forward Swept Wing Aircraft Conference, University of Bristol, Bristol, England, Mar. 24-26, 1982.) ONERA, TP* no. 1982-9, 1982. 12 p. 14 refs.

A schematic model with a 21-cm span was tested in the transonic S3Ch wind tunnel at M equals 0.5 to obtain aerodynamic data on various configurations with forward and aft swept wings with or without canards. Flow characteristics were described using flow visualizations in a water tunnel and in a wind tunnel. Results of calculations using a panel method show that the use of canards improves the forward swept wing flow field, even at low angles of attack. The longitudinal and lateral characteristics were compared, and various effects were investigated, including presence, location and sweep angle of canards, height of the wind relative to the fuselage and presence and sweep angle of the vertical tail. A

Theoretical and experimental analyses of the effects of very heavy rain on aircraft performance are summarized. Analysis reveals momentum loss, increased drag, and reduced lift resulting from cratering of the rainwater film on airfoils by raindrops. Momentum penalties were derived from a combined drop trajectory/potential flow analysis. The derived penalties were introduced into a digital flight simulation program and the effect of very heavy rain was compared to that of wind shear by performing landings in combinations of wind, rain, no wind, and no rain. Results show that the derived wind shears of accident reconstructions are too large because a significant part of the loss in indicated airspeed is caused by rain. Author (ESA)

N82-25180# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Forschungszentrum.

THE DFVLR DIGITAL FLIGHT DATA READOUT AND PROCESSING STATION AND ITS UTILITY

H. Hardegen *In its* Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 217-245

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Efforts to meet aviation authority requirements, scientific interest, and commercial requests at a flight data readout and processing station are described, with emphasis on bit rates, data fault correction, and reduction of data loss during transcription and reformatting. Regenerated data are recorded on computer tape and an eight-channel plot which provides a quick look the preceding flight history during regeneration is produced. All the computer programs are modular. After the program is started, the initital and final blocks are requested as the parameters to be calculated. Conversion from digital to engineering units is checked manually. Data losses are easily localized by counting the frames per minute and checking the synchronization words. Author (ESA)

N82-25181# Lufthansa German Airlines, Hamburg (West Germany).

SIDESLIP INDICATION SYSTEM AS A FUEL SAVING AID IN JET TRANSPORT AIRCRAFT OPERATION

Dieter Horst *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 247-275

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The relationship between sideslip angle heading constant, and roll angle is outlined and a sideslip sensor is described. A conical pressure sensing probe extends through the fuselage perpendicular to the local air flow. Unequal pressure arising from sideslip causes two paddle blades to rotate the probe until pressure on each paddle is equal, i.e., until the probe is realigned with the airstream. During rotation, output elements attached to the probe are also rotated, providing electrical signals proportional to sideslip angle to an indicator. Tests on an A-300 Airbus show that avoiding sideslip cuts fuel consumption by 0.2%. Author (ESA)

N82-25182# Societe de Fabrication d'instruments de Mesure SFIM, Massy (France).

AN INTERMEDIATE SOLUTION BETWEEN BASIC AND EXPANDED AIRCRAFT INTEGRATED DATA SYSTEMS (AIDS) c35

Claude Robert *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 277-300 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

A single digital flight data acquisition and management unit, divided for reliability into two parts, is proposed as an alternative to ARINC 717. One part deals with mandatory parameters which are sampled, coded, and transmitted in a PCM stream to the digital flight data recorder. The second part processes the parameters and is user programmable. Analysis consists of exceedance processing (e.g., engine, nacelle) gas pass analysis, AIDS monitoring and aircraft system warning from the flight warning computer. Airline response indicates that this system meets their requirements. Author (ESA)

N82-25183# Lockheed Aircraft Service, Inc., Ontario, Calif.

FLIGHT DATA RECOVERY UNDER ADVERSE CONDITIONS

E. J. Rosenbauer *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 301-322 ref

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Methods for overcoming data loss, including bit dump, bit shift, forward and reverse readout, time displacement compensation (TDC), wideband TDC, and supersynchronization are discussed. Supersynchronization systems recognize acquisition of any one sync word as an in-sync condition and process accordingly. They open a window prior to the end of the subframe which enables the circuit to look for the next sync work up to 8 bits early. A feedback loop enables one shot timing methods to track the average bit rate automatically. A time duration equal to 70.7% of the average bit period is recommended. A digital bit averaging technique, in which the bit decision time is determined by the average of the two previous bits, gives excellent results. With forward and reverse processing, data are processed in the usual way through the engineering conversion process. Valid data, prior to the out of sync area, look normal. The computer then goes to the end of the subframe and processes data from this point backwards toward the sync loss area. Author (ESA)

N82-25184# United Technologies Corp., Windsor Locks, Conn.

GAS PATH ANALYSIS OF COMMERCIAL AIRCRAFT ENGINES

Louis A. Urban *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 323-357

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

A mathematical means of determining overall engine performance, individual module performance and sensor performance from any specified set of engine parameters is introduced. If Ze = HeXe, where Ze is a set of engine measurement deltas, X2 is a set of engine module deviations and He is a set of partial derivatives, interrelating the two sets, it follows that Xe can be solved for by taking the product of Ze times the inverse of He (the diagnostic matrix). A maximum likelihood estimation technique ensures that measurements are noise free. Operating mode can include in-flight or ground-based analysis. Airline experience shows that gas path analysis is cost effective and technically sound. Author (ESA)

N82-25185# Technische Universitaet, Brunswick (West Germany). Lehrstuhl fuer Flugmechanik.

GROUND SPEED MEASUREMENT FROM DME/VHF OMNIRANGE NAVIGATION (VOR) DATA

P. Voersmann *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 359-380 refs

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Off-line computer results of DME/VOR ground speed are compared with data from an airborne inertial navigation system platform. Signal properties of DME/VOR data are discussed, and requirements for filtering the data are stated. Best agreement between the two systems (within 2 knots) is achieved when the aircraft is flying on a constant radial, i.e., when the radial ground speed is negligibly small. Oscillation of the radial ground speed component around low frequencies is attributed to hardware limitations. Author (ESA)

N82-25186# British Aluminum Co., Ltd., London (England).

GATHERING AND ANALYSING DATA ON THE BRITISH AIRWAYS BOEING 757 AIRCRAFT

Peter Waller *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 381-393

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

The maintenance and operational benefits of a data system connected to 24 serial digital data paths between avionics units are described. The set up includes a quick access recorder with on onboard playback capability, using a printer-plotter on the flight deck. A single unit collects, processes and distributes parameters. Separate processors handle the mandatory and integrated data system operations. Any parameter can be displayed, call up being through a simple mnemonic. Routine evaluation programs monitor flight operations, propulsion units, autoland performance and integrity, fuel performance, and the autoflight system. Engineers can request a printout of the times at which defined points of the flight occured, and use these to define the time at which reported incidents happened. The relevant parameters for this, and adjacent times, are quickly available. Author (ESA)

N82-25188# Leigh Instruments Ltd., Carleton Place (Ontario).

VALUE OF SURVIVABILITY AND RECOVERABILITY OF

FLIGHT DATA RECORDERS
James W. Wells and W. Donald Wells *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p 419-440 refs
Avail: NTIS HC A20/MF ; DFVLR, Cologne DM 122,90

Alternative design approaches to provide survival recorded flight information offer different degrees of effectiveness. The method of protecting recorded information selected in a given application should be that which provides the most economically effective capability. The value of accident information is derived from its usefulness in accident prevention. Capability and design trades for survivability versus contributions to usefulness of information is considered in terms of economic measurement. A method is outlined for assessing recorder survivability and recoverability direct benefits, (reduced cost of investigating accident or criminal intent) and bottom line benefits (reduction of aircraft grounding expenses or reduction of fault correction cost by more reliable data inputs). A.R.H.

N82-25189# British Aluminum Co., Ltd., London (England).
ANALYSIS OF TRANSIENT DATA FROM AIRCRAFT GAS TURBINE ENGINES USING AIDS
E. R. White *In* DFVLR Proc. of the 11th Symp. on Aircraft Integrated Data Systems Nov. 1981 p441-453

Avail: NTIS HC A20/MF A01; DFVLR, Cologne DM 122,90

Takeoff margin trending is used to illustrate engine monitoring, using in-flight data. For each takeoff, engine pressure ratio (EPR) data are collected at 80 knots, and the peak turbine temperature prior to liftoff is modified by an amount equal to any subsequent throttle movement. Total air temperature at 100 knots is converted to a static air temperature by subtracting an amount equivalent to the ram rise. Peak turbine temperature is corrected to ISA conditions, then for EPR, to a full rated takeoff level. This gives the turbine temperature that the engine would have produced at a full rated thrust under ISA conditions. The corrected temperature is subtracted from the red line limit, giving a margin which is plotted as a historical trend. These margins agree almost exactly with ground run data.
Author (ESA)

N82-25192# Stellenbosch Univ. (South Africa). Dept. of Engineering.
PREDICTION OF WING SIDE-EDGE SUCTION FORCES AND MAXIMUM INVISCID LIFT Ph.D. Thesis
C. Redelinghuys Sep. 1981 244 p refs
Avail: NTIS HC A11/MF A01

The possibility of predicting the characteristics of low aspect-ratio wings theoretically is investigated. A literature survey on theoretical techniques for edge seperated flows, vortex breakdown and maximum theoretical wing lift is presented. It is shown that prediction of the maximum theoretical lift by means of the suction analogy leads to results which differ from those obtained by means of previous techniques. Comparisons with experiment shows that low aspect ratio rectangular wings do achieve lift coefficients close to the theoretical maximum value. A new method, based on Lan's quasi-vortex-lattice method and the suction analogy, is developed for the prediction of the aerodynamics of unconventional planforms. Author

N82-25193*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN ANALYTICAL PROCEDURE FOR COMPUTING SMOOTH TRANSITIONS BETWEEN TWO SPECIFIED CROSS SECTIONS WITH APPLICATIONS TO BLENDED WING BODY CONFIGURATION
Raymond L. Barger May 1982 20 p refs
(NASA-TP-2012; L-15053; NAS 1.60:2012) Avail: NTIS HC A02/MF A01 CSCL 01A

An analytical procedure is described for designing smooth transition surfaces for blended wing-body configurations. Starting from two specified cross section shapes, the procedure generates a gradual transition from one cross section shape to the other as an analytic blend of the two shapes. The method utilizes a conformal mapping, with subsequent translation and scaling, to transform the specified and shapes to curves that can be combined more smoothly. A sample calculation is applied to a blended wing-body missile type configuration with a top mounted inlet.
S.L.

N82-25194*# Boeing Commercial Airplane Co., Seattle, Wash.
A HARMONIC ANALYSIS METHOD FOR UNSTEADY TRANSONIC FLOW AND ITS APPLICATION TO THE FLUTTER OF AIRFOILS Final Report
F. Edward Ehlers and Warren H. Weatherill Washington NASA May 1982 151 p refs
(Contract NAS1-15957)
(NASA-CR-3537; NAS 1.26:3537; D6-49821) Avail: NTIS HC A08/MF A01 CSCL 01A

A finite difference method for solving the unsteady transonic flow about harmonically oscillating wings is investigated. The procedure is based on separating the velocity potential into steady and unsteady parts and linearizing the resulting unsteady differential equation for small disturbances. The differential equation for the unsteady velocity potential is linear with spatially varying coefficients and with the time variable eliminated by assuming harmonic motion. A study is presented of the shock motion associated with an oscillating airfoil and its representation by the harmonic procedure. The effects of the shock motion and the resulting pressure pulse are shown to be included in the harmonic pressure distributions and the corresponding generalized forces. Analytical and experimental pressure distributions for the NACA 64A010 airfoil are compared for Mach numbers of 0.75, 0.80 and 0.842. A typical section, two-degree-of-freedom flutter analysis of a NACA 64A010 airfoil is performed. The results show a sharp transonic bucket in one case and abrupt changes in instability modes. Author

N82-25196*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL/FLIGHT CORRELATION, 1981
L. Wayne McKinney, ed. and Donald D. Baals, ed. Jun. 1982 224 p refs Workshop held at Hampton, Va., 19-20 Nov. 1981
(NASA-CP-2225; L-15368; NAS 1.55:2225) Avail: NTIS HC A10/MF A01 CSCL 14B

Wind-tunnel/flight correlation activities are reviewed to assure maximum effectiveness of the early experimental programs of the National Transonic Facility (NTF). Topics included a status report of the NTF, the role of tunnel-to-tunnel correlation, a review of past flight correlation research and the resulting data base, the correlation potential of future flight vehicles, and an assessment of the role of computational fluid dynamics.

N82-25197*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATUS OF THE NATIONAL TRANSONIC FACILITY
Robert L. Swain *In its* Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 1-21

Avail: NTIS HC A10/MF A01 CSCL 14B

Construction status of major tunnel systems/subsystems of the National Transonic Facility, an advanced high Reynolds number capability wind tunnel utilizing cryogenic nitrogen as the fluid medium is presented. N.W.

N82-25198*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
REVIEW OF THE 1980 WIND-TUNNEL/FLIGHT CORRELATION PANEL
Theodore G. Ayers *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 23-32 refs

Avail: NTIS HC A10/MF A01 CSCL 01A

Wind tunnel/flight correlation history from the P-51 to the F-8 supercritical wing is reviewed, showing that researchers continue to be faced with nearly identical discrepencies in predicted versus measured drag. The capabilities of the National Transonic Facility to allow assessment of the effects which have heretofore plagued researchers and aircraft designers are anticipated. N.W.

N82-25199*# Lockheed-Georgia Co., Marietta.
WIND-TUNNEL/FLIGHT-DRAG CORRELATION
John H. Peterson *In* NASA. Langley Research Center Wind-Tunnel/Flight Correlation, 1981 Jun. 1982 p 33-46 refs
Avail: NTIS HC A10/MF A01 CSCL 01A

Predicted and flight-test drag on the C-5A and the C-141 are correlated. Equivalent rigid flight-test profile drag and a rigid estimate based on wind tunnel data are also correlated. Correlations for the National Transonic Facility are included.
N.W.

Subsonic aerodynamic and flutter characteristics of several wings calculated by the SOUSSA P1.1 panel method
[NASA-TM-84485] N82-25216
Thrust-induced effects on low-speed aerodynamics of fighter aircraft --- Langley 4- by 7-meter tunnel
[NASA-TM-83277] N82-25218
Production version of the extended NASA-Langley Vortex Lattice FORTRAN computer program. Volume 1: User's guide
[NASA-TM-83303] N82-25219
Nonlinear two-dimensional sail theory
[AD-A110450] N82-25220
Experimental analysis of the effects of sweep and aspect ratio on incompressible flow about forward swept wings
[AD-A111128] N82-25223
The FFA wing body 81 computer program. A panel method for determination of aerodynamic characteristics at subsonic and supersonic speeds
[FFA-TN-AU-1601] N82-25230
Aerodynamics/ACEE: Aircraft energy efficiency
[NASA-FACTS-94/8-81] N82-25241

AERODYNAMIC COEFFICIENTS
Aerodynamic coefficient identification of time-varying aircraft system and its application
A82-34645
The effect of very heavy rain upon aircraft and its role in wind shear attributed accidents
N82-25179
Experimental analysis of the effects of sweep and aspect ratio on incompressible flow about forward swept wings
[AD-A111128] N82-25223
Leading edge flap system for aircraft control augmentation
[NASA-CASE-LAR-12787-1] N82-25240

AERODYNAMIC CONFIGURATIONS
Rime ice accretion and its effect on airfoil performance
[NASA-CR-165599] N82-24166
F-15 rotary balance data for an angle-of-attack range of 8 deg to 90 deg
[NASA-CR-3478] N82-24168
Rotary balance data for an F-15 model with conformal fuel tanks for an angle-of-attack range of 8 deg to 90 deg
[NASA-CR-3516] N82-24169
Wind tunnels of the institute of mechanics of Moscow State University
[NASA-TM-76909] N82-24213
Flight management computer
[SNIAS-821-111-110] N82-24842
An analytical procedure for computing smooth transitions between two specified cross sections with applications to blended wing body configuration
[NASA-TP-2012] N82-25193
F-16E program overview and wind tunnel/flight correlation
N82-25207
Water tunnel flow visualization and wind tunnel data analysis of the F/A-18 --- leading edge extension vortex effects
[NASA-CR-165859] N82-25215
Materials and structures/ACEE
[NASA-FACTS-117/8-81] N82-25242

AERODYNAMIC DRAG
The initial lift and drag of an impulsively started airfoil of finite thickness
A82-34538
Review of the 1980 Wind-Tunnel/Flight Correlation Panel
N82-25198
Experimental analysis of the effects of sweep and aspect ratio on incompressible flow about forward swept wings
[AD-A111128] N82-25223

AERODYNAMIC FORCES
Forward-swept-wing technology
A82-33309
Finite element calculation of the aerodynamic forces on a vibrating wing in supersonic flow
A82-34128
Hysteresis of the normal force of a wing of complex planform under unsteady motion
A82-34157
Accounting for thickness effects in the calculation of subcritical unsteady aerodynamic forces: Application to wing-fuselage interactions
[SNIAS-821-111-106] N82-24183
Experimental verification of force determination and ground flying on a full-scale helicopter
[USAAVRADCOM-TR-81-D-11] N82-24199

AERODYNAMIC HEATING
Approximate method of predicting heating on the windward side of Space Shuttle Orbiter and comparisons with flight data
[AIAA PAPER 82-0823] A82-31853
An experimental study at free-stream Mach 5 of the aerodynamic heating of the upper surface of plane wings of various planforms
A82-34149

AERODYNAMIC INTERFERENCE
Closed-form solutions of supersonic wing-body interference
A82-33120
Darrieus rotor aerodynamics
A82-33708
Experimental determination of flow-interference effects of wing-mounted, two-dimensional, full-capture propulsion nacelles in close proximity to a vehicle body at a Mach number of 6
[NASA-TM-83287] N82-25217

AERODYNAMIC LOADS
On the aerodynamics of windblast
[AD-A110495] N82-25221
Statistical review of counting accelerometer data for Navy and Marine fleet aircraft from 1 January 1962 to 30 June 1981
[AD-A110660] N82-25243

AERODYNAMIC NOISE
Aeroacoustic performance of an externally blown flap configuration with several flap noise suppression devices
[NASA-TP-1995] N82-24942

AERODYNAMIC STABILITY
Downwash behind a wing with spanwise blowing
A82-33514
Will ABC technology produce the next-generation helicopter
A82-33916
Instability effects on pylon and engine loading in an aircraft with high-aspect-ratio wings
A82-34163
Guidance and control/ACEE
[NASA-FACTS-95/8-81] N82-25261

AERODYNAMIC STALLING
Effects of dynamic stall on SWECS --- Small Wind Energy Conversion System
A82-33707
Will ABC technology produce the next-generation helicopter
A82-33916
Aeroelasticy of compressor blades: Subsonic stall flutter
N82-26189

AERODYNAMICS
Vertical takeoff technology - Flight mechanics, aerodynamics, and propulsion systems --- German book
A82-33348
Aerodynamics. Part 2 - Methods of aerodynamic design /3rd revised and enlarged edition/ --- Russian book
A82-33387
Aerodynamics: The science of air in motion /2nd edition/ --- Book
A82-33671
Flow visualization techniques for the study of high incidence aerodynamics
[ONERA, TP NO. 1982-5] A82-34493
Combining analysis with optimization at Langley Research Center. An evolutionary process
[NASA-TM-84472] N82-24846

AEROELASTICITY
Identification of the form of motion of an aircraft
A82-31824
Finite element calculation of the aerodynamic forces on a vibrating wing in supersonic flow
A82-34128
Development of a control law for the alleviation of maneuver loads on an elastic aircraft
A82-34144

An algorithm for calculating the compliance matrices of aircraft structures by the substructure method as applied to aeroelasticity problems
A82-34161

A method of accounting for the effect of aircraft deformations on its loading
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La Recherche Aerospatiale, Bi-monthly bulletin, number 1981-6, November-December 1981 --- aerodynamic research
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Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980
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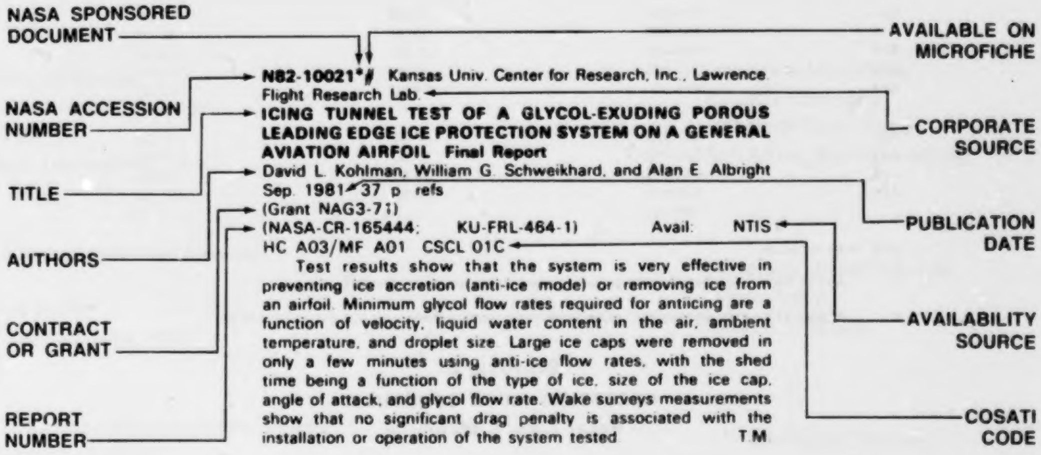

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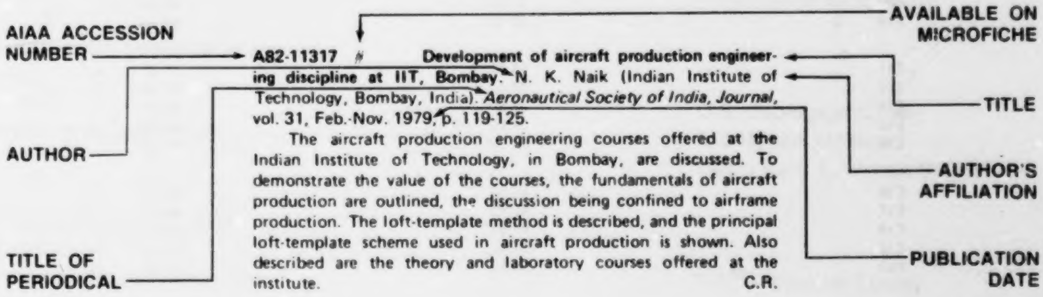
N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

TYPICAL CITATION AND ABSTRACT FROM *IAA*



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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

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IAA ENTRIES

A82-34976 * # Selected results of the F-15 propulsion interactions program. L. D. Webb and J. Nugent (NASA, Ames Research Center, Edwards, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1041.* 15 p. 10 refs.

A better understanding of propulsion system/airframe flow interactions could aid in the reduction of aircraft drag. For this purpose, NASA and the United States Air Force have conducted a series of wind-tunnel and flight tests on the F-15 airplane. This paper presents a correlation of flight test data from tests conducted at the NASA Dryden Flight Research Facility of the Ames Research Center, with data obtained from wind-tunnel tests. Flights were made at stabilized Mach numbers around 0.6, 0.9, 1.2, and 1.5 with accelerations up to near Mach number 2. Wind-tunnel tests used a 7.5 percent-scale F-15 inlet/airframe model. Flight and wind-tunnel pressure coefficients showed good agreement in most cases. Correlation of interaction effects caused by changes in cowl angle, angle-of-attack, and Mach number are presented. For the afterbody region, the pressure coefficients on the nozzle surfaces were influenced by boattail angles and Mach number. Boundary-layer thickness decreased as angle of attack increased above 4 deg. (Author)

A82-34977 # Selection of a starting system for a low cost single engine fighter aircraft. W. F. Keller (Northrop Corp., Hawthorne, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1043.* 6 p.

Selection of a starting system for a low cost, single engine turbofan fighter aircraft requires identification of ground start alternatives, study of the need for airstart assist and, if the need is found, of available airstart alternatives. It also requires consideration of the special inflight starting requirements of turbofan engines, and evaluation of alternatives on the basis of appropriate design criteria. Review of turbofan engine inflight starting requirements led to the conclusion that the need for airstart assist is real but infrequent, and that multiple airstart assist is not required. Alternatives were identified using the morphological approach. Evaluation, on the basis of both quantitative (weight, volume, cost, etc.) and qualitative criteria (logistics, risk, flexibility, etc.), led to selection of an air turbine cartridge starter. The starter uses compressed air from a start cart as the ground energy source and hot gas from decomposition of hydrazine monopropellant liquid, stored in a sealed cartridge, as the inflight energy source. (Author)

A82-34978 * # Evaluation of a simplified gross thrust calculation method for a J85-21 afterburning turbojet engine in an altitude facility. J. L. Baer-Riedhart (NASA, Ames Research Center, Edwards, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1044.* 12 p. 7 refs.

A simplified gross thrust calculation method was evaluated on its ability to predict the gross thrust of a modified J85-21 engine. The method used tailpipe pressure data and ambient pressure data to predict the gross thrust. The method's algorithm is based on a one-dimensional analysis of the flow in the afterburner and nozzle. The test results showed that the method was notably accurate over the engine operating envelope using the altitude facility measured thrust for comparison. A summary of these results, the simplified gross thrust method and requirements, and the test techniques used are discussed in this paper. (Author)

A82-34979 # Ceramic component development for limited-life propulsion engines. D. W. Richerson and J. M. Wimmer (Garrett Turbine Engine Co., Phoenix, AZ). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1050.* 7 p. DARPA-supported research; Contract No. N00024-76-C-5352.

The use of ceramic materials for high-temperature components in gas turbine engines offers significant payoffs for a broad range of commercial and military applications. However, the task of integrating ceramics into advanced gas turbine engines represents a difficult challenge. In February 1976, the Ceramic Gas Turbine Engine Demonstration Program was initiated with the objective to meet this challenge. The engine selected for the demonstration was the Garrett Model T76 turboprop engine, a 715-horsepower engine whose various derivatives are used both for military and civil aircraft propulsion and as an industrial and marine engine. The turbine section was redesigned to use ceramic gas-path components. An increase of approximately 350 F in turbine inlet temperature was projected to increase engine output to 1000 horsepower and decrease specific fuel consumption by 10%. G.R.

A82-34980 # Energy efficient engine /E3/ technology status. W. B. Gardner (United Technologies Corp., Commercial Products Div., East Hartford, CT). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1052.* 10 p. 15 refs.

The Energy Efficient Engine (EEE) Technology program has the objective to establish the technology readiness of components and subsystems which could be utilized in turbofan engines in the late 1980's, early 1990's. A description is presented of the results of the supporting technology programs, the status and results of the component verification testing to date, and the possibilities for employing the developed technology in connection with the design of an energy efficient, environmentally acceptable engine for the 1990's. Attention is given to aspects of shroudless fan fabrication, the diffuser/combustor model, a combustor sector rig, an uncooled high-pressure turbine rig, supersonic high-pressure turbine cascades, a high-pressure turbine cooling model, aspects of high-pressure turbine leakage control, and subsonic cascades. G.R.

A82-34981 * # Turbine blade nonlinear structural and life analysis. R. L. McKnight, J. H. Laflen (General Electric Co., Cincinnati, OH), G. R. Halford, and A. Kaufman (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1056.* 9 p. 9 refs.

The utility of advanced structural analysis and life prediction techniques was evaluated for the life assessment of a commercial air-cooled turbine blade with a history of tip cracking. Three dimensional, nonlinear finite element structural analyses were performed for the blade tip region. The computed strain-temperature history of the critical location was imposed on a uniaxial strain controlled test specimen to evaluate the validity of the structural analysis method. Experimental results indicated higher peak stresses and greater stress relaxation than the analytical predictions. Life predictions using the Strainrange Partitioning and Frequency Modified approaches predicted 1200 to 4420 cycles and 2700 cycles to crack initiation, respectively, compared to an observed life of 3000 cycles. (Author)

A82-34982 * # Blade loss transient dynamic analysis of turbomachinery. M. J. Stallone, V. Gallardo, A. F. Storace, L. J. Bach, G. Black, and E. F. Gaffney (General Electric Co., Cincinnati, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1057.* 8 p. Contract No. NAS3-22053.

This paper reports on work completed to develop an analytical method for predicting the transient non-linear response of a complete aircraft engine system due to the loss of a fan blade, and to validate the analysis by comparing the results against actual blade loss test data. The solution, which is based on the component element method, accounts for rotor-to-casing rubs, high damping and rapid deceleration rates associated with the blade loss event. A comparison of test results and predicted response show good agreement except for an initial overshoot spike not observed in test. The method is effective for analysis of large systems. (Author)

A82-34983 * # Experimental study of the effects of secondary air on the emissions and stability of a lean premixed combustor. G. Roffe, R. S. V. Raman (General Applied Science Laboratories, Inc., Westbury, NY), and C. J. Marek (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1072.* 10 p. 7 refs. NASA-supported research.

A study of the effects of secondary air addition on the stability and emissions of a gas turbine combustor has been performed. Tests were conducted with two types of flameholders and varying amounts of dilution air addition. Results indicate that NO(x) decreases with increasing dilution air injection, whereas CO is independent of the amount of dilution air and is related to the gas temperature tive, regenerative/intercooled and advanced conventional cycle screening studies were carried out to select the cycle pressure ratio and turbine temperature for each type, considering the effects on installed performance and weight. Design and cycle choices were studied in each engine category including recuperator types, effectiveness, pressure drop, bypass bleed and variable area turbine nozzle. The engine characteristics of each type were then compared using a representative mission. The advanced conventional engine showed the largest potential, the regenerative second and the regenerative/intercooled the least promise for lower installed fuel consumption and improved mission performance. (Author)

A82-35409 * # The effect of rotor blade thickness and surface finish on the performance of a small axial flow turbine. R. J. Roelke (NASA, Lewis Research Center, Cleveland, OH) and J. E. Haas (U.S. Army, Propulsion Laboratory, Cleveland, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-222.* 6 p. 9 refs. Members, $2.00; nonmembers, $4.00. (Previously announced in STAR as N82-13114)

A82-35411 # Effect of impeller extended shrouds on centrifugal compressor performance as a function of specific speed. L. Sapiro. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-228.* 11 p. Members, $2.00; nonmembers, $4.00.

Centrifugal compressors for gas compression applications usually employ low-pressure ratio, backward-swept impellers with vaneless diffusers. To increase the compressor flow range and speed, impeller blades are occasionally trimmed, resulting in an extended shroud configuration. The effect of extended front and back impeller shrouds on the performance of centrifugal compressors with vaneless diffusers, and the variation of this effect as a function of specific speed, is thus of concern and is the subject of this paper. An investigation was carried out on two backward-swept shrouded impellers of common blade tip and inducer hub diameters, but different inducer tip diameters (corresponding to low and high specific speeds), with the front and back shrouds extending 20 percent above the blade's outside diameter. (Author)

A82-35412 # The calculation of deviation angle in axial-flow compressor cascades. L. C. Wang (Nanjing Aeronautics Institute, Nanjing, People's Republic of China), R. Hetherington (Cranfield Institute of Technology, Cranfield, Beds., England), and A. Goulas. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-230.* 6 p. 17 refs. Members, $2.00; nonmembers, $4.00.

The deviation angles of axial flow compressor cascades have been predicted by solving the Reynolds averaged fully turbulent Navier-Stokes equations. A finite element method has been used. To close the problem an algebraic eddy viscosity turbulent model has been chosen. The introduction of the idea of vorticity to the governing equation enables the establishment of a relation between the entropy and the vorticity fields, and the vorticity transport differential equation in the stream function-vorticity method is replaced by a differential operation. A series of calculations have been carried out to examine the influence of cascade geometry on the deviation angle. Very good agreement has been obtained for small angles of incidence with the correlations produced by NASA and using Carter's rule. Good agreement has also been shown for the variation of deviation angle with the angle of incidence with the experimental data of Felix and Emery, as well as for the distribution of the pressure coefficient along the blade axial chord. (Author)

A82-35413 # Transient vibration of high speed lightweight rotor due to sudden imbalance. M. Sakata (Tokyo Institute of Technology, Tokyo, Japan), H. Ohnabe (Ishikawajima-Harima Heavy Industries Co., Ltd., Tanashi, Tokyo, Japan), and T. Aiba. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-231.* 8 p. 11 refs. Members, $2.00; nonmembers, $4.00.

A transient vibration analysis is carried out on a flexible disk-flexible shaft system or rigid disk-flexible shaft system subjected to a sudden imbalance which is assumed to represent the effect of blade loss. Galerkin's method is used to solve the basic equation governing a rotating flexible disk, and the equation of motion of the rotor system is numerically solved using the Runge-Kutta method. A model rotor with a blade loss simulator is examined, and shaft vibrations are measured. For subcritical blade loss or sudden increase of imbalance, the maximum amplitude increases with disk flexibility and the analysis with cycloidal front step-type imbalance increase predicts larger peak values in the response curves than that with unit step balance increase. D.L.G.

A82-35415 # Experimental evaluation of squeeze film supported flexible rotors. M. D. Rabinowitz (SCITEC Corp., Sydney, Australia) and E. J. Hahn (New South Wales, University, Kensington, Australia). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-233.* 10 p. 15 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Australian Research Grants Committee.

This paper describes the experimental investigations which were conducted to verify existing theoretical vibration amplitude predictions for centrally preloaded, squeeze film supported flexible rotors. The influence of measurement errors and operating condition uncertainties are quantified. The agreement between theory and experiment was excellent, and it is shown that any discrepancy can be explained in terms of errors in determining the mean lubricant viscosity and the orbit magnitudes. Hence, for the range of parameters investigated, the theoretical model and predictions therefrom are validated. (Author)

A82-35418 # Next generation turboprop gearboxes. W. L. McIntire and D. A. Wagner (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, IN). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-236.* 9 p. 7 refs. Members, $2.00; nonmembers, $4.00.

A new generation of fuel-efficient turboprop propulsion systems is under consideration now that fuel is a significant portion of the direct operating cost of aircraft. Systems in the 5000- to 15,000-hp (3730- to 11,185-kW) range that use conventional propellers or the new propfan are being studied. Reduction gearing for this next generation of turboprops is of significant interest due to new requirements for cruise speed life, and reliability. Detroit Diesel Allison's past experience with the T56 family of turboprop reduction gearboxes is recounted. Probable requirements of the next generation of reduction gearboxes are discussed since new requirements for gearboxes combined with past experience should determine the profile of the next generation of gearboxes. A discussion of gearbox general arrangement and its impact on airframe installation is included, along with comments on reduction ratio, gear arrangement, accessory drives, reliability goals, and probable technology needs. (Author)

A82-35425 # Engine experience of turbine rotor blade materials and coatings. F. N. Davis and C. E. Grinnell (Rolls-Royce, Ltd., Coventry, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-244.* 9 p. 9 refs. Members, $2.00; nonmembers, $4.00.

Corrosion resistance of hot end components was evaluated on Rolls-Royce industrial and marine gas turbines. Early materials and coatings assessment trials were performed, and extended cyclic running of up to 2500 hours for a single test was carried out to assess component reliability and various material/coating combinations. Results of cyclic running under agressive conditions suggest the need for two layer coating systems. The change from wrought Nimonic alloys to cast superalloys for turbine rotor blades has produced a marked increase in corrosion resistance, and to date, platinum aluminide has demonstrated best overall protection characteristics and can be standardized for production engines. D.L.G.

A82-35426 Heat transfer measurements of a transonic nozzle guide vane. M. R. Litchfield (National Gas Turbine Establishment, Farnborough, Hants., England) and R. J. G. Norton (Rolls-Royce, Ltd., Aero Div., Derby, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-247.* 10 p. 12 refs. Members, $2.00; nonmembers, $4.00.

The heat transfer and aerodynamic characteristics of a turbine nozzle guide vane with a supersonic exit velocity have been measured in a transient cascade facility. The vane possesses a convergent-divergent passage, and this, together with a low trailing edge wedge angle, is seen to control the supersonic flow efficiently at design conditions. Heat transfer measurements have been taken on both suction and pressure surfaces. On the suction surface, transition is marked by a rapid increase in heat transfer, whereas on the pressure surface a slow increase in heat transfer indicates the gradual onset of turbulence. The measurements also indicate possible relaminarisation of the suction surface boundary layer at the impingement of the trailing edge shock. Predictions are presented of aerodynamic flow, using an inviscid time-marching calculation, and heat transfer, using a differential method applied to the vane surface. (Author)

A82-35429 # An advanced helicopter engine control system. A. F. Saunders (Dowty and Smiths Industries Controls, Ltd., Cheltenham, Glos., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-250.* 12 p. Members, $2.00; nonmembers, $4.00.

A full-authority digital engine control and intelligent cockpit command box has been designed and developed in order to: (1) demonstrate continued improvement in IC technology, with its associated increases in computing power; (2) employ control laws more relevant to electronic control, thereby obviating precise fuel metering by a hydromechanical unit; and (3) significantly improve engine and system performance monitoring methods. The control system described has undergone successful engine tests with a GEM helicopter engine, and is scheduled to be tested in prototype form aboard a Lynx military helicopter. O.C.

A82-35430 # **An approach to software for high integrity applications.** W. C. Dolman and J. P. Parkes (Lucas Aerospace, Ltd., Birmingham, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-251.* 10 p. Members, $2.00; nonmembers, $4.00.

This paper outlines one approach taken in designing a software system for the production of high quality software for use in gas turbine control applications. Central to the approach is a special control language with its inherent features of visibility, reliability and testability, leading to a software system which can be applied to applications in which the integrity of the units is of prime importance. The structure of the language is described together with the method of application in the field of aircraft gas turbine control. The provision of documentation automatically is an integral part of the system together with the testing procedures and test documentation. A description of how these features are combined into the total software system is also given. (Author)

A82-35432 # **Ceramic components for automotive and heavy duty turbine engines - CATE and AGT 100.** H. E. Helms and J. A. Byrd (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, IN). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-253.* 10 p. 9 refs. Members, $2.00; nonmembers, $4.00.

Detroit Diesel Allison is actively applying advanced ceramic materials to components in gas turbine engines. Silicon carbide, silicon nitride, aluminum silicate, lithium aluminum silicate, and mullite are materials being used in various components in both the DDA GT 404-4 and AGT 100 engines. Approximately 9400 hr of ceramic component operating time in the GT 404 engine has been accumulated, and design, component processing, proof testing, and engine testing experience have begun to show the applicability of ceramic materials in production engines. Material variability, processing procedures, strength characterization, and nondestructive evaluations are emerging as critical but controllable factors. Ceramic components offer the potential of significant fuel consumption improvements in gas turbine engines for vehicles and other applications. (Author)

A82-35433 # **The influence of engine characteristics on patrol aircraft life cycle cost optimization.** A. J. Schuetz (Lockheed-California Co., Burbank, CA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-256.* 6 p. Members, $2.00; nonmembers, $4.00.

Peacetime utilization is postulated in an estimation of the engine duty cycle of a novel, land-based patrol aircraft, whose propulsion system incorporates high-speed turboprop engines and whose flight profile is that of the antisubmarine mission. It is determined that, where aircraft design has been optimized for minimum takeoff gross weight and life cycle costs, performance requirements and design constraints circumscribe the optimization process to the extent that the same point design is obtained for the takeoff weight and life cycle cost criteria. Engine cost contribution to overall life cycle costs is examined, and the sensitivity of aircraft optimization to such aircraft characteristics as specific fuel consumption, length, diameter and cost is analyzed. It is found that specific fuel consumption is the most significant engine characteristic. O.C.

A82-35436 # **Cycle considerations for tactical fighters in the early 1990's.** H. D. Snyder (United Technologies Corp., Pratt and Whitney Aircraft Group, West Palm Beach, FL). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-259.* 5 p. 6 refs. Members, $2.00; nonmembers, $4.00.

The possibility of a new tactical fighter for the 1990s is considered, and various aspects of such a fighter are discussed, including maneuverability, avionics, takeoff and landing, observables, supersonic persistence, and range. A probable peacetime training syllabus is set out. It is concluded that a jet cycle is preferable than a fan cycle in such an aircraft, and that combustor inlet temperatures will be increased for maneuverability and supersonic persistence. The overall engine pressure ratio will be moderate (18-22) and the engine pressure ratio will be high (3.5-4.5). The engine will probably have a two-dimensional reversing/vectoring nozzle and the radar cross section of the inlet will be reduced. A longer engine development cycle will be necessary to improve engine capability, while also improving operability, reliability, and maintainability. C.D.

A82-35446 # **Performance improvement features of General Electric turbofan engines.** D. J. Lennard and W. A. Fasching (General Electric Co., Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-270.* 7 p. 10 refs. Members, $2.00; nonmembers, $4.00.

Turbofan engine performance improvement features are presented, for engines already in operation and those currently undergoing development, with attention to fuel consumption reduction. Several of the performance improvement features incorporated have emerged from the NASA Engine Component Improvement program, and include fan, compressor, and high and low pressure turbine clearance modifications. Fan and exhaust nozzle aerodynamics improvements, reduced flowpath losses, and high efficiency turbine cooling are discussed. The evolutionary process of feature incorporation has yielded a specific fuel consumption improvement in the CF6-80C engine of 8% over the original CF6-50 design. O.C.

A82-35447 * # **Interim review of the Energy Efficient Engine /E3/ Program.** W. B. Gardner, W. Hannah, and D. E. Gray (United Technologies Corp., Commercial Products Div., East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-271.* 10 p. 12 refs. Members, $2.00; nonmembers, $4.00. NASA-sponsored research.

The NASA-sponsored Energy Efficient Engine (E3) Program, which is now in its fourth year, is assessed from the viewpoint of one of its research contractors. Attention is given to the development status of the shroudless fan, segmented combustor and exhaust mixer components which are encompassed by the program. The shroudless fan blades are two-thirds hollow for lightness, and are fabricated by means of plies and cores subjected to hot isostatic pressing diffusion bonding. The combustor's segmented liner is cast from turbine blade materials. Exhaust mixer flow visualization tests are described. Consideration is given to the effects of integrating the technology described with the low and high pressure advanced turbines whose development is also part of the E3 program. O.C.

A82-35448 * # **NASA ECI programs - Benefits to Pratt and Whitney engines.** W. O. Gaffin (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-272.* 8 p. 5 refs. Members, $2.00; nonmembers, $4.00. NASA-sponsored research.

Proprietary research conducted under the NASA-sponsored Engine Component Improvement program is shown to have advanced the state of such component technologies as thermal barrier coatings, ceramic seal systems, advanced turbine clearance control, and JT9D engine fan design. In addition, the tests conducted have demonstrated the advantages of updated cooling, sealing and aerodynamic designs in the high pressure turbine and compressor of the JT9D engine. These technological advances are being transferred to such novel engine configurations as the PW2037 and NASA Energy Efficient Engine. Attention is given to the results of the thermal coating refinement tests of convectively cooled vanes, and to the development of a single shroud fan design applicable to the JT9D and next-generation engines. O.C.

A82-35450 * # **Progress in the development of energy efficient engine components.** R. W. Bucy (General Electric Co., Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-275.* 7 p. 8 refs. Members, $2.00; nonmembers, $4.00. Contract No. NAS3-20643.

Component test results are presented for the NASA Energy Efficient Engine program, whose design goals relative to the CF6-50C reference engine include a 12% reduction in specific fuel consumption, 5% reduction in direct operating costs, and 50% reduction in specific fuel consumption deterioration rate over the course of commercial service. Emphasis is placed on the engine's high pressure compressor, which has a design pressure ratio of 23:1, and has completed a series of component tests whose resulting configuration is expected to meet all major objectives of the program. Descriptions are given of the core engine and integrated core/low spool tests, and system test benefits are discussed. Attention is given to the design features of the engine's double annular combustor, high and low pressure air turbines, and scale model exhaust mixer. O.C.

A82-35453 # **Material and process impact on aircraft engine designs of the 1990's.** R. A. Sprague (GE Material and Process Technology Laboratories, Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-278.* 10 p. Members, $2.00; nonmembers, $4.00.

Major material and process technology areas are discussed in terms of their impact on future engine performance. Airfoil materials development will concentrate on enhancing high temperature mechanical properties. New single-crystal or eutectic alloys, and overlay and/or thermal barrier coatings will permit increases of up to 250 F in allowable metal temperature capability. Increases in turbine inlet temperature and the desire to reduce engine weight and life cycle costs will drive disk material development toward attainment of higher tensile, creep, and fatigue strengths through development of dual-property disks, which combine new alloy compositions with novel processing techniques, and by increased application of polymeric composites. Rapid solidification plasma deposition technology promises to permit fabrication of complex, multialloy structural parts with improved mechanical properties and environmental resistance. Definition of new laboratory testing procedures and analyses will lead to better management of life cycle costs through enhanced materials utilization. C.D.

to improve a NASTRAN model of the AH-1G airframe. The calculated forces were applied to the improved NASTRAN Analytical model and the predicted accelerations were in agreement with accelerations measured on the AH-1G airframe in flight. G.R.

A82-37783 * # Design and evaluation of a state-feedback vibration controller. R. W. Du Val (NASA, Ames Research Center, Moffett Field, CA), C. Z. Gregory, Jr., and N. K. Gupta (Integrated Systems, Inc., Palo Alto, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-10.* 14 p.

The effectiveness and practicality of the state-feedback vibration controller is demonstrated by computer simulations. It is shown that: (1) the required measurements can be reduced to fuselage accelerations; (2) the system is stable over a wide range of flight conditions; (3) a discrete design for the controller provides effective digital implementation at 80-Hz sampling; (4) attenuation produced by the actuators does not create a problem, and a simple lead compensator provides vibration reduction; and (5) a design based on a hover model worked well at five knots. At 40 and 120 knots, vibrations in all but the vertical acceleration were effectively suppressed. The state-feedback vibration controller has a rapid convergence time and implementation is easier than with multicyclic control since no on-line harmonic analysis or identification algorithms are required. C.D.

A82-37784 Rotor state estimation for rotorcraft. J. W. Fuller. *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-11.* 10 p. 8 refs.

Studies of rotor control indicate that helicopter ride quality in gusty conditions can be significantly improved if rotor state feedback is used in an automatic flight controller. The present investigation is concerned with the design of an algorithm for estimating tip-path plane (TPP), and TPP rate for use in a feedback controller, given blade flapping measurements. The presence of the direct rotor measurements means that the estimator does not need to rely on detailed knowledge of helicopter and rotor dynamics. Therefore, a simple model of rotor dynamics is used. One problem still remains. The measurement equations, relating the measurements to the TPP states, are periodically time-varying. Current steady-state estimator synthesis techniques require time-invariant system equations. This problem is solved by analytically determining a coordinate transformation which converts the system equations to time-invariant forms. G.R.

A82-37785 * A simple system for helicopter individual-blade-control and its application to stall-induced vibration alleviation. N. D. Ham and T. R. Quackenbush (MIT, Cambridge, MA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-12.* 10 p. NASA-sponsored research.

A new, advanced type of active control for helicopters and its application to a system for stall flutter suppression is described. The system, based on previously developed M.I.T. Individual-Blade-Control hardware, employs blade-mounted accelerometers to sense torsional oscillations and feeds back rate information to increase the damping of the first torsion mode. A linear model of the blade and control system dynamics is used to give qualitative and quantitative guidance in the design process as well as to aid in analysis of experimental results. System performance in wind tunnel tests is described and evidence is given of the system's ability to provide substantial additional damping to stall-induced blade oscillations. (Author)

A82-37786 * # Considerations of open-loop, closed-loop, and adaptive multicyclic control systems. I. Chopra (NASA; Stanford Joint Institute for Aeronautics and Acoustics; Stanford University, Stanford, CA) and J. L. McCloud, III (NASA, Ames Research Center, Moffett Field, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-13* 23 p. 8 refs.

Four different types of self-tuning regulators were studied for multicyclic control of helicopter vibration. A numerical simulation of the helicopter is made, using a multivariable frequency-domain model, in terms of transfer function with six input control harmonics and six output harmonics. The model characteristics vary with flight speed. An off-line identification of model characteristics is made, using the least-squared-error method and using a succession of input and output measurements. The on-line identification of model characteristics is made using the Kalman filter solution. The optimal controls are calculated from the minimization of quadratic performance function based on response and multicyclic inputs. The performance of various regulators or controllers is judged from the stability, transient response, convergence time, and amplitude of the steady state. C.D.

A82-37787 Total main rotor isolation system. D. R. Halwes (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-15.* 8 p.

An analytical study is described in which six LIVE (Liquid Inertia Vibration Eliminator) isolator elements are combined to establish the requirements, preliminary design, and verification procedures for a total main rotor isolation system at n/rev. This approach provides the high potential for total isolation in all degrees of freedom necessary for any type rotor system without excessive weight and complexity. The LIVE system has numerous advantages over mechanical inertia isolators, including reduced complexity, no bearings, a smaller envelope for installation, linear response at high g's, and much lower weight and cost. Analysis of the system after installation in a 206 LM helicopter showed better than 95% isolation for a weight penalty of less than 3/4% of design gross weight. N.B.

A82-37788 Flight demonstration of an integrated floor/fuel isolation system. R. Gabel, P. Teare, and R. A. Desjardins (Boeing Vertol Co., Philadelphia, PA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-16.* 11 p.

A vibration isolation system has been developed for the passenger cabin and the long range fuel tanks of the Boeing Commercial Chinook. The passenger floor is isolated from the airframe on a series of passive isolation units. The fuel tanks are also isolated so that their varying dynamic mass is effectively nulled at all fuel levels, thereby avoiding any deleterious effects on airframe natural frequency placement. Analyses, component tests, an aircraft shake test and now flight tests have verified the effectiveness of the system. Passenger cabin vibration levels are below 0.05 g at the 135 knot cruise speed and beyond. These flight vibration levels are insensitive to fuel quantity, despite variation from 14,000 lb down to reserve. (Author)

A82-37789 Semi-active fluid inertia - A new concept in vibration isolation. D. L. Margolis (California, University, Davis, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-17* 14 p. 10 refs.

A vibration isolation system which features semi-active control of fluid inertia for broad-band applications on helicopter rotor inputs is described. Semi-active control theory is reviewed, along with the skyhook concept in a continuously variable configuration. The fluid inertia based isolator is modeled numerically, noting that the use of a variable orifice and a control strategy presents a nonlinear control problem. The actual proposed device consists of a cylinder of fluid with a piston, connected by means of a long tube to some mass. The fluid-filled tube is an effective mass which provides isolation performance from, for example, helicopter downwash. Modulating the orifice in the tube allows the semi-active control. Applications during take-off and landing phases of flight, when variable engine speeds are encountered, are indicated. M.S.K.

A82-37790 Assessment of the dynamic response of a structure when modified by the addition of mass, stiffness or dynamic absorbers. S. P. King (Westland Helicopters Ltd., Yeovil, Somerset, England). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-18.* 10 p.

An algorithm suitable for estimating the modes and frequencies created by the introduction of reconfigured fuselages and mass spring systems to a new helicopter during the design and development phases is presented. The new modes are expressed as linear combinations of known modes and the degree of coupling resulting from the projected structural changes can be assessed. Application of the algorithm for the case of added stiffness is made, along with examples of added mass or an absorber. It is shown that the model is useful for examining the effects of varying the same parameter and also for determining the additive effects of a number of structural modifications. Comparison with the outcome of an eigenvalue analysis shows good agreement for a 39 degree of freedom two-dimensional lumped parameter model, with the algorithm underestimating the frequency reduction. M.S.K.

A82-37791 Monofilar - A dual frequency rotorhead absorber. T. Mouzakis (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-20.* 9 p.

A monofilar absorber is centrifugally tuned two degree of freedom device which reacts and reduces vibratory forces at two frequencies using a single active mass. A mathematical model of the monofilar is presented together with both linear and nonlinear equations of motion. It is shown that the desired natural frequencies (3P and 5P for a four bladed rotor) can be obtained with physically achievable mass, inertia and geometric properties and that the performance of the monofilar is equivalent to that of a standard bifilar. Therefore, the monofilar absorber design will allow reductions in weight, parts, maintenance and production costs, relative to the conventional bifilar absorber. (Author)

A82-37792 # A finite element analysis of coupled rotor fuselage vibration. M. J. Rutkowski (U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-21.* 15 p. 6 refs.

The dynamic coupling between the rotor system and the fuselage of a simplified helicopter model in hover is investigated. The rotor-fuselage model is based on a two-degrees-of-freedom beam finite element with polynomial mass and stiffness properties. The linear matrix equations of motion for the system include centrifugal stiffness and quasi-steady aerodynamic damping matrices for the rotor elements and structural damping matrices for both rotor and fuselage elements. Both real and complex eigenanalyses are carried out to obtain mode shapes and modal frequencies as a function of rotor speed. Forced-response vibration results for the case of a radially uniform, harmonic load applied to the rotor are also described. The uncoupled rotor-fuselage frequencies in vacuo are poor approximations to the actual coupled frequencies near rotor-fuselage frequency coalescence, but including rotor aerodynamic design provides some improvement. The magnitude of the resonant response at the fuselage mode frequencies is highly dependent on their proximity to the blade mode frequencies. C.D.

A82-37793 * **A unified approach to helicopter NASTRAN modeling.** J. J. Brown, R. A. Christ, K. L. Kilroy, and G. R. Parker (Hughes Helicopters, Inc., Culver City, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-22.* 8 p.

An approach unifying stress and dynamics analysis is presented. A common stress model is employed along with an automated method of assembling the mass data, and a variation of the subspace iteration technique is used to reduce the dynamic equations, resulting in timely, economical turnaround of any design changes and elimination of the problems associated with the use of two models. The dynamics group adds mass data to the stress model to form the dynamic model, while the structures department develops and maintains a common NASTRAN bulk data base accessed by both groups. The basic model supplies the stiffness data to predict internal loads for the stress analyst and to calculate modal data for the dynamicist. Structural and nonstructural mass data are processed separately before being combined and added to the stiffness model to produce the dynamic model. Application to the AHIP aircraft is demonstrated. C.D.

A82-37794 # **A nonlinear response analysis for coupled rotor-fuselage systems.** D. L. Kunz (U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-23.* 22 p. 11 refs.

The governing equations for a fully coupled, rotor-fuselage vibration model are derived. There are three sets of equations involved. First are the equations of motion for a uniform, elastic blade that can undergo flap and lead-lag bending deflections. The second set of equations comprises the hub-load equations. For both the blade and hub-load equations, the aerodynamic forces are derived from quasi-steady strip theory. In modeling the fuselage, beam finite-elements and generalized isolator elements are used to generate the third set of equations, the fuselage equations of motion. The blade and fuselage responses, as well as the hub loads, are computed by an iterative, combined harmonic-balance, impedance-matching method. In addition, the uncoupled blade and fuselage modes and frequencies, which are by-products of the blade and fuselage analyses, and the coupled system natural frequencies may be obtained. (Author)

A82-37795 * **Substructure program for analysis of helicopter vibrations.** R. Sopher (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-24.* 21 p. 12 refs. Contract No. NAS1-16058.

A substructure vibration analysis which was developed as a design tool for predicting helicopter vibrations is described. The substructure assembly method and the composition of the transformation matrix are analyzed. The procedure for obtaining solutions to the equations of motion is illustrated for the steady-state forced response solution mode, and rotor hub load excitation and impedance are analyzed. Calculation of the mass, damping, and stiffness matrices, as well as the forcing function vectors of physical components resident in the base program code, are discussed in detail. Refinement of the model is achieved by exercising modules which interface with the external program to represent rotor induced variable inflow and fuselage induced variable inflow at the rotor. The calculation of various flow fields is discussed, and base program applications are detailed. C.D.

A82-37796 * **Determination of rotor wake induced empennage airloads.** S. T. Gangwani (United Technologies Research Center, East Hartford, CT). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-26.* 16 p. 10 refs. Army-supported research; Contract No. NAS1-16058.

A computer program has been developed that predicts the unsteady aerodynamic forces that impinge on the empennage surface due to its interactions with the main rotor wake. The program was utilized to determine the vibration airloads acting on the Black Hawk horizontal stabilizer and on the CH-53A stabilizer under high speed forward flight conditions. The results demonstrate that it is possible to compute the high frequency empennage vibration airloads efficiently by utilizing suitable analysis techniques; a CH-53A case required only 1.3 minutes of computer time. Numerical problems associated with the unsteady Kutta condition have been minimized. Even though the analysis is of transient nature, the results for harmonic cases show a very fast convergence to periodicity. In general, good correlation was shown between the predicted vibratory airloads and the measured stabilizer airloads for a CH-53A helicopter operating at high speed flight conditions. C.D.

A82-37797 **Use of optimization in helicopter vibration control by structural modification.** G. T. S. Done (City University, London, England). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-27.* 8 p. 7 refs. Research sponsored by Westland Helicopters Ltd., and Royal Aircraft Establishment.

A method is described of computing the structural changes necessary to reduce the vibration in part of a helicopter fuselage subject to a constant frequency excitation at the rotor head. The method is applied to a simple two-dimensional 60 degree of freedom model. A number of structural parameters considered suitable candidates for change are selected, and then values of these parameters are computed using an optimization routine such that a function involving the response over part of the structure is minimised. The results provide the basis for useful discussion on various aspects of the selection and optimization exercises. (Author)

A82-37832 # **The DC-10 Chicago crash and the legality of SFAR 40.** G. Richard. In: Annals of air and space law. Volume 6. (A82-37826 18-84) Montreal, McGill University; Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1981, p. 195-218. 42 refs.

Legal issues arising out of the invocation of SFAR 40 after the 1979 crash of a DC-10 passenger aircraft are discussed in terms of the effects on international agreements and on the Chicago convention. The decision, made by the head of the U.S. agency, the FAA, grounded all foreign and domestic flights of DC-10s in the U.S., thus extending sovereign jurisdiction to aircraft owned by other nations and/or foreign companies. Standards for airworthiness established by the ICAO in signing the multinational Chicago Convention agreements are reviewed, and it is noted that empty foreign DC-10 aircraft were allowed to fly over the U.S. after the decision. It is concluded that the decision to invoke the SFAR 40 provision was not legally sound because the head of the FAA had no jurisdiction over DC-10 aircraft under foreign registry. M.S.K.

A82-37854 * **Performance of PTFE-lined composite journal bearings.** H. E. Sliney (NASA, Lewis Research Center, Cleveland, OH) and F. J. Williams (Rockwell International Corp., North American Aviation Div., Los Angeles, CA). *American Society of Lubrication Engineers, Annual Meeting, 37th, Cincinnati, OH, May 10-13, 1982, Preprint 82-AM-1A-1.* 7 p. 10 refs. Contract No. NAS3-22123.
(Previously announced in STAR as N82-17263)

A82-37855 * **Geometrical aspects of the tribological properties of graphite fiber reinforced polyimide composites.** R. L. Fusaro (NASA, Lewis Research Center, Cleveland, OH). *American Society of Lubrication Engineers, Annual Meeting, 37th, Cincinnati, OH, May 10-13, 1982, Preprint 82-AM-5A-2.* 11 p. 21 refs.
(Previously announced in STAR as N82-15198)

A82-37857 **Wear by generation of electrokinetic streaming currents.** T. R. Beck (Electrochemical Technology Corp., Seattle, WA). *American Society of Lubrication Engineers, Annual Meeting, 37th, Cincinnati, OH, May 10-13, 1982, Preprint 82-AM-6A-3.* 6 p. 16 refs.

Hydraulic control valves in commercial aircraft are subject to 'erosion' in service with phosphate ester fluids, due to corrosion from generation of electrokinetic streaming currents. This 'zeta corrosion' phenomenon is now well understood. The theory is extended here to calculate current densities that would be generated on the surfaces of lubricated journal bearings and roller bearings. Measurements of such current densities made with a disk electrode in a simulated journal bearing are in approximate agreement with the model. Many aspects of bearing wear reported in the literature are consistent with the zeta corrosion mechanism. (Author)

A82-37861 * # **Chordwise and compressibility corrections for arbitrary planform slender wings.** D. Levin (NASA, Ames Research Center, Moffett Field, CA) and A. Seginer (Technion - Israel Institute of Technology, Haifa, Israel). *AIAA Journal*, vol. 20, Aug. 1982, p. 1025-1030. 14 refs.

The Lomax and Sluder method for adapting slender-wing theory to delta or

AN ANALYTICAL STUDY OF TURBULENCE RESPONSES, INCLUDING HORIZONTAL TAIL LOADS, OF A CONTROL CONFIGURED JET TRANSPORT WITH RELAXED STATIC STABILITY M.S. Thesis
Boyd Perry, III 17 Feb 1975 122 p refs
Avail NTIS HC A06/MF A01

The turbulence responses of control configured vehicles (CCV) with relaxed static stability (RSS) are discussed. Three similar vehicle configurations employing two types of static stability augmentation systems (SSAS) at two flight conditions (two Mach numbers at constant altitude are considered. The configurations include a baseline (statically stable) configuration and two representative CCV (statically unstable) configurations, featuring one with baseline geometry and one with a significantly reduced horizontal tail. Stability, flying qualities, and maneuverability requirements are imposed on the airplane-SSAS systems and denote representative requirements imposed on a CCV with RSS. Using these requirements as a common base, the rigid airframe and tail load turbulence responses are examined in terms of configuration changes for a given SSAS and in terms of SSAS changes for a given configuration. Turbulence response calculations for each SSAS indicate that even though the tail load responses for the unstable configuration with the small tail are less than those for the stable configuration, the tail loads per unit tail volume are larger. B.W.

N82-26314*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FLIGHT EXPERIMENTS USING THE FRONT-SIDE CONTROL TECHNIQUE DURING PILOTED APPROACH AND LANDING IN A POWERED LIFT STOL AIRCRAFT
W. S. Hindson (National Research Council of Canada), G. H. Hardy, and R. C. Innis Apr. 1982 87 p refs
(NASA-TM-81337; A-8777; NAS 1.15:81337; FRL-TR-LTR-FR-81) Avail: NTIS HC A05/MF A01 CSCL 01C

The essential features of using pitch attitude for glidepath control in conjunction with longitudinal thrust modulation for speed control are described, using a simple linearized model for a powered-lift STOL aircraft operating on the backside of the drag curve and at a fixed setting of propulsive lift. It is shown that an automatic speed-hold system incorporating heave-damping augmentation can allow use of the front-side control technique with satisfactory handling qualities, and the results of previous flight investigations are reviewed. Manual control considerations, as they might be involved following failure of the automatic system, are emphasized. The influence of alternative cockpit controller configurations and flight-director display features were assessed for their effect on the control task, which consisted of a straight-in steep approach flown at constant speed in simulated instrument conditions. Author

N82-26315*# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
LATERAL CONTROL SYSTEM DESIGN FOR VTOL LANDING ON A DD963 IN HIGH SEA STATES M.S. Thesis
Marc Bodson May 1982 221 p refs
(Grant NGL-22-009-124)
(NASA-CR-169074; NAS 1.26:169074; LIDS-TH-1209) Avail: NTIS HC A10/MF A01 CSCL 01C

The problem of designing lateral control systems for the safe landing of VTOL aircraft on small ships is addressed. A ship model is derived. The issues of estimation and prediction of ship motions are discussed, using optimal linear linear estimation techniques. The roll motion is the most important of the lateral motions, and it is found that it can be predicted for up to 10 seconds in perfect conditions. The automatic landing of the VTOL aircraft is considered, and a lateral controller, defined as a ship motion tracker, is designed, using optimal control techniqes. The tradeoffs between the tracking errors and the control authority are obtained. The important couplings between the lateral motions and controls are demonstrated, and it is shown that the adverse couplings between the sway and the roll motion at the landing pad are significant constraints in the tracking of the lateral ship motions. The robustness of the control system, including the optimal estimator, is studied, using the singular values analysis. Through a robustification procedure, a robust control system is obtained, and the usefulness of the singular values to define stability margins that take into account general types of unstructured modelling errors is demonstrated. The minimal destabilizing perturbations indicated by the singular values analysis are interpreted and related to the multivariable Nyquist diagrams. Author

N82-26316# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
INVESTIGATION OF AN IMPROVED STRUCTURAL MODEL FOR DAMAGED T-38 HORIZONTAL STABILIZER FLUTTER ANALYSIS USING NASTRAN M.S. Thesis
Lex Clayton Dodge Dec. 1981 62 p refs
(AD-A111095; AFIT/GAE/AA/81D/6) Avail: NTIS HC A04/MF A01 CSCL 01/1

This thesis investigates tuning a finite element model and applying the procedures to the T-38 horizontal stabilizer for use on NASTRAN. The T-38 stabilizer model is to be used in a subsequent flutter analysis. Static and dynamic analysis has shown the model to have inadequate bending and torsional stiffness. The model was tuned in the frequency domain with free-free boundary conditions. The tuned frequencies and mode shapes show good correlation to the measured values. The finite element model was shown to not contain variables that significantly influence the torsion modes frequencies more than the bending frequencies. Eigenvalue analysis of the tuned model with aircraft installed boundary conditions produced good results for all but the first torsion frequency. This frequency was tuned by increasing the model's control system stiffness. This tuned model produces good frequencies and mode shapes. Additional investigation is needed to compare the dynamic model corrections to the static model corrections found by Jack Sawdy, AF IT/GAE/AA/81D-27. Author (GRA)

N82-26317# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
MINIMUM TIME TURNS CONSTRAINED TO THE VERTICAL PLANE M.S. Thesis
Christopher S. Finnerty Dec. 1981 77 p refs
(AD-A111096; AFIT/GAE/AA/81D-7) Avail: NTIS HC A05/MF A01 CSCL 01/2

The objective of this study is to find the throttle controls and trajectories which yield the minimum turning times for a high performance aircraft with thrust reversal capability. The aircraft remains in the vertical plane allowing only pull-up and split-s maneuvers. A second-order parameter optimization method coupled with the suboptimal control approach is used to solve the minimum time-to-turn problem. The results of the study found that trajectories restricted to the vertical plane gave different results, and in at least one case better results, than those not so constrained. The results also indicate that depending on the maneuver performed, thrust reversal is beneficial in reducing the minimum time-to-turn regardless of whether the aircraft's initial velocity is above or below corner speed. Finally, the results demonstrate that thrust reversal can be utilized for minimum time turns with resulting increases in specific energy. GRA

N82-26318# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
USE OF ENTIRE EIGENSTRUCTURE ASSIGNMENT WITH HIGH-GAIN ERROR-ACTUATED FLIGHT CONTROL SYSTEMS M.S. Thesis
Darrell Brett Ridgely Dec. 1981 155 p refs
(AD-A111098; AFIT/GAE/AA/81D-24) Avail: NTIS HC A08/MF A01 CSCL 01/3

The theory of high-gain error-actuated feedback control, developed by Porter and Bradshaw, was applied to the design of various longitudinal decoupling flight control systems for an advanced aircraft. The controllers developed in this study utilized output feedback with proportional plus integral control to produce desirable closed-loop response with minimal interaction between outputs. This report describes how entire eigenstructure assignment can be used to determine appropriate measurement equations by assigning their corresponding transmission zeros. A singular value decomposition was used to choose the eigenvectors from their permissible subspaces. The results show that these modes appear in the output response, even for very high gain. Therefore, selection of good eigenvalues/eigenvectors was shown to be crucial to the successful application of this theory. This report also examined the effect of varying the other design parameters on the closed-loop system response. GRA

N82-26319# Lear, Inc., Grand Rapids, Mich. Instrument Div.
INTEGRATED FLIGHT TRAJECTORY CONTROL Final Report, Aug. 1979 - May 1981

Gregory L. Comegys and Garrett R. Hanson Wright-Patterson AFB, Ohio AFWAL Aug 1981 151 p refs
(Contract F33615-79-C-3624; AF Proj. 2403)
(AD-A110998; ID-01R-0481; AFWAL-TR-81-3077) Avail: NTIS HC A08/MF A01 CSCL 01/3

IPTC programs demonstrated by simulation the ability to compute four dimensional reference trajectories and provide guidance commands to the pitch and role autopilot axes for vertical and lateral aircraft control, and to the autothrottle for thrust and accurate time of arrival control. The ability of the trajectory generator to respond to pilot induced flight plan deviations and data linked mission changes was also demonstrated. Conventional cathode ray tubes (CRTs) were utilized for flight plan graphics and alphanumeric display. The IFTC Development Program was concerned with adding certain functions to increase the tactical flight management capabilities of the concept. IFTC was integrated with the Firefly II advanced air to ground weapon delivery algorithms to provide ingress and egress flight path generation and control. The LSI developed Mission Data Transfer System (MDIS) was added to the simulation to demonstrate the aid to mission planning and the rapid data initialization of the simulated airborne system. Author

N82-26320# Bunker-Ramo Corp., Westlake Village, Calif. Electronic Systems Div.

SIMULATION REPORT: ADVANCED DISPLAY FOR COMPLEX FLIGHT TRAJECTORIES Final Report, Jun. - Oct. 1980

Peter B. Lovering, Debra A. Warner, Deborah K. Park, Matthew Miller, and Stuart B. Burdess (AFWAL) Wright-Patterson AFB, Ohio AFWAL Jun. 1981 72 p refs
(Contract F33615-78-C-3614; AF Proj. 2403)
(AD-A111259; AFWAL-TR-81-3057) Avail: NTIS HC A04/MF A01 CSCL 01/2

Several cockpit display problems were revealed during flight tests of complex approach trajectories in support of the Microwave Landing System (MLS) Program. Among these problems were pilot orientation with respect to the approach profile and the runway, verifying proper performance along the prescribed path and cross-checking or monitoring profile computations. This document contains a brief background statement regarding the display and describes the simulator experiment, results and recommendations for display improvement. In all, eight rated Air Force Pilots of varying backgrounds flew approximately 264 curved, multi-segmented glideslope approaches in a variety of simulated wind conditions. Data collection included objective performance with respect to the desired flight path and pilot opinion on each of the new display features. Generally, pilots were favorably impressed with the display concept and recommended further development. GRA

N82-26321# Applied Science Associates, Inc., Valencia, Pa.

MAINTENANCE TRAINING SIMULATOR DESIGN AND ACQUISITION: HANDBOOK OF ISB PROCEDURES FOR DESIGN AND DOCUMENTATION Interim Report, Mar. 1979 - Mar. 1980

Rohn J. Hritz, Hobart J. Harris, Jennifer A. Smith, and George R. Purifoy, Jr. Brooks AFB, Tex. AFHRL Feb. 1982 215 p
(Contract F33615-78-C-0019; AF Proj. 2361)
(AD-A111430; AFHRL-TP-81-51) Avail: NTIS HC A10/MF A01 CSCL 05/9

This technical paper presents a method for deriving training requirements, selecting an approach for meeting the training objectives identified, and making training equipment fidelity and instructional feature design decisions where training hardware is needed. The procedures supplement existing materials (AFP 50-58, and the 3306th Test and Evaluation Squadron Procedural Handbook, Edwards AFB) by clarifying existing training technology and providing new procedures to assist the ISD analyst in designing and documenting training equipment. The handbook expands upon currently used procedures in three major decision areas. These are (a) determining which training requirements require hardware or training equipment of some type, (b) selecting the degree of fidelity with which to represent components and parts on the training equipment, and (c) choosing instructional features to be incorporated in the training equipment. All procedures use decision flow charts to increase objectivity. The method results in documentation that is to be used as a basis for completing the ISD-Derived Training Equipment Design. The design is then communicated to the Simulator System Program Office (SimSPO) for use in preparing procurement specifications to contractors. Author (GRA)

N82-26322# Calspan Field Services, Inc., Arnold Air Force Station, Tenn.

PERFORMANCE OF THE AEDC MARK 1 AEROSPACE ENVIRONMENTAL CHAMBER WITHOUT OIL DIFFUSION PUMPING Final Report

W. B. Stephenson and R. E. Alt Feb. 1982 28 p refs
(AD-A111406; AEDC-TR-81-32) Avail: NTIS HC A03/MF A01 CSCL 14/2

The 40- by 80-ft MK-I Aerospace Environmental Chamber was pumped down to a pressure of 2 x 10 to the minus 6th power torr in order to verify an operational mode that could maintain test conditions without the use of oil diffusion pumping. Mechanical pumps rough pumped into the micron (1 to 10.0 x 10 to the minus 3rd power torr) range, and the cryogenic arrays reduced the pressure to 2 x 10 to the minus 6th power torr and maintained it for 24 hours. The pumpdown without the use of diffusion pumping is often dictated by test requirements for exceptional cleanliness. After pumpdown, inbleeding of CO2, H2, and N2 affected chamber pressure as a function of gas species and inflow rate. The time for the liquid nitrogen and gaseous helium-cooled cryosurfaces to cool down and warm up was determined as an aid to test planning. Because several modifications to the cryopumping geometry had been made since the chamber was initially placed into service, it was considered important to verify the MK-I performance. It is concluded that the mechanical roughing/cryogenic pumping method of operation is satisfactory for simulation of conditions where the outgassing is relatively small or consists of gases with low vapor pressure at liquid nitrogen temperature (i.e., CO2 or H2O). GRA

N82-26323# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics

OPTIMAL PLACEMENT MODEL FOR THE B-52G WEAPONS SYSTEM TRAINER M.S. Thesis

Franklin E. Hoke, Jr. Sep. 1981 79 p refs
(AD-A110977; AFIT/LSSR-83-81) Avail: NTIS HC A05/MF A01 CSCL 15/5

As a result of the Force Modernization Study, the Strategic Air Command will have its first new generation simulator, the Weapons System Trainer (WST), available in the beginning of 1982. Because of the highly intensive requirements of B-52 training, it had been determined that each B-52 unit would be equipped with a total WST system. While there is agreement with the strategic implications of individual base location for the WST, the necessity of that decision should be questioned. The original research question directed at G model bases was: Can an economically optimum location scheme be determined for the minimum number of WST's necessary to meet training requirements? Consequently, the central objective of this research was the development of a mathematical model which would assure the optimum placement of the WST based on the defined resources, constraints, and economic criteria. The research and generated solutions lend credence to the model as a management tool, in that it permits an objective analysis of alternatives in terms of cost location schemes and number of simulators. It is concluded that the model should provide useful information in future simulator location studies. Author (GRA)

N82-26324# Federal Aviation Administration, Washington, D.C. Office of Aviation Policy and Plans.

FINAL REGULATORY EVALUATION: METROPOLITAN WASHINGTON AIRPORTS POLICY Final Report

Lawrence A. Pearsall and Douglas A. Samuelson Oct. 1981 187 p refs
(AD-A110583; FAA-APO-81-12) Avail: NTIS HC A09/MF A01 CSCL 01/2

This final regulatory evaluation examines the potential impacts of rules to be applied to aircraft operations at Washington National Airport. These rules are part of the overall policy toward the development of Washington National Airport and Dulles International Airport. The alternative economic impacts on airlines, passengers, communities and the FAA of imposing passenger ceilings, operations quotas, landing fees, perimeter rules, curfews, and noise restrictions under various scenarios are assessed in this evaluation, and the final rule is specifically addressed in the final Chapter. The quantifiable impacts of this rule are estimated at a $27 million net cost to society, but this net cost is believed to be outweighed by benefits which cannot be measured. Author (GRA)

N82-26325# Naval Training Equipment Center, Orlando, Fla. Visual Technology Research Simulator

Cost and fuel consumption per nautical mile for two engine jet transports using OPTIM and TRAGEN
[NASA-CR-168973] N82-25239

JET AIRCRAFT NOISE
Model based study of various configurations of jet crossing a cavity - Application to the CEPRA 19 wind tunnel of CEPr
A82-33627
Airbus industry and noise in the community
[SNIAS-821-111-111] N82-24739
Aeroacoustic performance of an externally blown flap configuration with several flap noise suppression devices
[NASA-TP-1995] N82-24942

JET ENGINE FUELS
Impact study of synthetic and alternative fuel usage in Army aircraft propulsion systems
[AD-A111046] N82-24355

JET ENGINES
Development of an aircraft engine
A82-34112
Development of an analytical technique for the optimization of jet engine and duct acoustic liners
[NASA-CR-169002] N82-25256

JET EXHAUST
Aerodynamic interactions with turbulent jet exhaust plumes
A82-33325

JP-4 JET FUEL
Evaluation of three percent Aqueous Film Forming Foam (AFFF) concentrates as fire fighting agents --- JP-4 jet fuel fires
[AD-A110821] N82-25402

K

KEVLAR (TRADEMARK)
Materials and structures/ACEE
[NASA-FACTS-117/8-81] N82-25242

L

LAMINAR FLOW
Effect of modification of the trailing edge of a separating wall on the downstream mixing of parallel flowing streams
[AD-A111124] N82-24181

LAMINAR FLOW AIRFOILS
The NASA Langley laminar flow control airfoil experiment
[AIAA PAPER 82-0567] A82-33327

LAMINAR HEAT TRANSFER
Approximate method of predicting heating on the windward side of Space Shuttle Orbiter and comparisons with flight data
[AIAA PAPER 82-0823] A82-31853

LAMINATES
Standard tests for toughened resin composites --- for aircraft structures
[NASA-RP-1092] N82-24301

LANDING AIDS
Marine Air Traffic Control and Landing System (MATCALS Investigation), volume 1
[AD-A110862] N82-24188
Marine Air Traffic Control and Landing System (MATCALS Investigation), volume 2
[AD-A110863] N82-24189

LANDING GEAR
OV-10A nose gear fork damage analysis
[AD-A111492] N82-25244
Fireproof brake hydraulic system
[AD-A111319] N82-25245

LASER DOPPLER VELOCIMETERS
An experimental investigation of the flow field of an ejector wing design employing a photon correlation laser velocimeter
[AD-A111134] N82-24182
Hardware and software integration for concurrent data acquisition and reduction of photon correlated laser Doppler velocimetry
[AD-A111146] N82-25506

LASER SPECTROMETERS
In situ ozone data for comparison with laser absorption remote sensor: 1980 PEPE/NEROS program
[NASA-TM-84471] N82-25661

LATERAL CONTROL
Leading edge flap system for aircraft control augmentation
[NASA-CASE-LAR-12787-1] N82-25240

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near the walls. The axial location of the dilution air addition has no effect on the performance or stability. Results also indicate that the amount of secondary air entrained by the flameholder recirculation zone is dependent on the amount of dilution air and flameholder geometry. (Author)

A82-34993 # **Influence of airblast atomizer design features on mean drop size.** N. K. Rizk and A. H. Lefebvre (Purdue University, West Lafayette, IN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1073.* 7 p. 15 refs.

Measurements of mean drop size, using the light-scattering technique, were carried out on eight different airblast atomizers. The liquids employed were water and kerosine. The test range included wide variations in atomizing air velocity, air pressure, and liquid and air flow rates, but the main objective was to examine the influence of scale and various design features on atomization performance. The results obtained show, for all types of airblast atomizer, that atomization quality is improved by increase in ambient air pressure, decrease in atomizer size, and by minimizing the angle of impact between the fuel jet and the high velocity air stream. (Author)

A82-34994 # **Numerical and experimental examination of a prevaporized/premixed combustor.** C. L. Proctor, II (Florida, University, Gainesville, FL) and A. M. Mellor. *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1074.* 11 p. 10 refs. USAF-sponsored research.

An experimental prevaporizing/premixing combustor configuration was examined numerically and experimentally. Non-reacting flow field calculations were made using the computer code 'CORA2'. Experimental evaluation of the combustor configuration was accomplished by extracting gas samples at discrete locations from within the combustor and analyzing them for unburned hydrocarbons (UHC), CO, CO2, and O2. These data were used to calculate local combustion efficiency and temperature. Contour plots were developed to interpret the gaseous flow field. Results indicate two distinct regions of combustion: one in the recirculation zone providing constant ignition of incoming air/fuel mixture, and another where vitiated air impinges on the burning air/fuel mixture downstream of the ignition source. (Author)

A82-34995 * # **Advancements in real-time engine simulation technology.** J. R. Szuch (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1075.* 9 p. 21 refs.
(Previously announced in STAR as N82-22915)

A82-34996 # **Transport engine control design.** J. F. Kuhlberg, J. Kniat, D. M. Newirth, J. C. Jamison, and J. R. Switalski (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, CT). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1076.* 11 p. 7 refs.

A full authority digital electronic control was selected for the Pratt and Whitney Aircraft PW2037 turbofan transport engine. This control system will provide optimum engine performance and fuel economy, high operational reliability, minimum pilot workload, simplified control maintenance procedures, and maximum engine protection. A general description of the system is presented and benefits are discussed. (Author)

A82-34997 * # **Development of a helicopter rotor/propulsion system dynamics analysis.** W. Warmbrodt (NASA, Ames Research Center, Moffett Field, CA) and R. Hull (Systems Control Technology, Inc., Palo Alto, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1078.* 16 p. 12 refs.

A time-domain analysis of coupled engine/drive train/rotor dynamics of a twin-engine, single main rotor helicopter model has been performed. The analysis incorporates an existing helicopter model with nonlinear simulations of a helicopter turboshaft engine and its fuel controller. System dynamic behavior is studied using the resulting simulation which included representations for the two engines and their fuel controllers, drive system, main rotor, tail rotor, and aircraft rigid body motions. Time histories of engine and rotor RPM response to pilot control inputs are studied for a baseline rotor and propulsion system model. Sensitivity of rotor RPM droop to fuel controller gain changes and collective input feed-forward gain changes are studied. Torque-load-sharing between the two engines is investigated by making changes in the fuel controller feedback paths. A linear engine model is derived from the nonlinear engine simulation and used in the coupled system analysis. This four-state linear engine model is then reduced to a three-state model. The effect of this simplification on coupled system behavior is shown. (Author)

A82-34998 # **Analysis of two-dimensional internal flows using a primitive-variable relaxation Navier-Stokes procedure.** R. K. Scharnhorst (McDonnell Aircraft Co., St. Louis, MO). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1083.* 10 p. 18 refs. Research supported by the McDonnell Aircraft Co.

Accurate and economic internal flow analysis procedures are needed for the efficient design of suitable diffuser and nozzles in advanced fighter aircraft engines. The largely empirical conventional approach used for the design of such components is inefficient and time-consuming, and it might fail to produce optimal design solutions. The present study is concerned with the latest stages in the development of a primitive-variable, relaxation Navier-Stokes solution procedure. A two-dimensional version was developed primarily to become familiar with the involved technique. A two-dimensional analysis procedure can provide information regarding valuable performance trends of preliminary diffuser and nozzle designs. The computational time required for the implementation of the considered procedure was found to be significantly less than that of classical time dependent approaches, and no difficulties have been encountered for separated flows. G.R.

A82-34999 * # **NASA Broad Specification Fuels Combustion Technology program - Pratt and Whitney Aircraft Phase I results and status.** R. P. Lohmann (United Technologies Corp., Commercial Products Div., East Hartford, CT) and J. S. Fear (NASA, Lewis Research Center, Aerothermodynamics and Fuel Div., Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1088.* 12 p. 11 refs.

In connection with increases in the cost of fuels and the reduced availability of high quality petroleum crude, a modification of fuel specifications has been considered to allow acceptance of poorer quality fuels. To obtain the information upon which a selection of appropriate fuels for aircraft can be based, the Broad Specification Fuels Combustion Technology program was formulated by NASA. A description is presented of program-related investigations conducted by an American aerospace company. The specific objective of Phase I of this program has been to evaluate the impact of the use of broadened properties fuels on combustor design through comprehensive combustor rig testing. Attention is given to combustor concepts, experimental evaluation, results obtained with single stage combustors, the stage combustor concept, and the capability of a variable geometry combustor. G.R.

A82-35000 * # **NASA/General Electric broad-specification fuels combustion technology program - Phase I results and status.** W. J. Dodds, E. E. Ekstedt, D. W. Bahr (General Electric Co., Aircraft Engine Business Group, Cincinnati, OH), and J. S. Fear (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1089.* 12 p. 14 refs.

A program is being conducted to develop the technology required to utilize fuels with broadened properties in aircraft gas turbine engines. The first phase of this program consisted of the experimental evaluation of three different combustor concepts to determine their potential for meeting several specific emissions and performance goals, when operated on broadened property fuels. The three concepts were a single annular combustor; a double annular combustor; and a short single annular combustor with variable geometry. All of these concepts were sized for the General Electric CF6-80 engine. A total of 24 different configurations of these concepts were evaluated in a high pressure test facility, using four test fuels having hydrogen contents between 11.8 and 14%. Fuel effects on combustor performance, durability and emissions, and combustor design features to offset these effects were demonstrated. (Author)

A82-35017 * # **In-flight acoustic results from an advanced-design propeller at Mach numbers to 0.8.** K. G. Mackall, P. L. Lasagna, K. Walsh (NASA, Ames Research Center, Edwards, CA), and J. H. Dittmar (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1120.* 9 p. 6 refs.

Acoustic data for the advanced-design SR-3 propeller at Mach numbers to 0.8 and helical tip Mach numbers to 1.14 are presented. Several advanced-design propellers, previously tested in wind tunnels at the Lewis Research Center, are being tested in flight at the Dryden Flight Research Facility. The flight-test propellers are mounted on a pylon on the top of the fuselage of a JetStar airplane. Instrumentation provides near-field acoustic data for the SR-3. Acoustic data for the SR-3 propeller at Mach numbers up to 0.8, for propeller helical tip Mach numbers up to 1.14, and comparison of wind tunnel to flight data are included. Flowfield profiles measured in the area adjacent to the propeller are also included. (Author)

A82-35018 * # **Interior noise considerations for advanced high-speed turboprop aircraft.** J. S. Mixson, F. Farassat, J. D. Leatherwood (NASA, Langley Research Center, Hampton, VA), R. Prydz, and J. D. Revell (Lockheed-California Co., Burbank, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1121.* 12 p. 25 refs.

This paper describes recent research on noise generated by high-speed propellers, on noise transmission through acoustically treated aircraft sidewalls and on subjective response to simulated turboprop noise. Propeller noise discussion focuses on theoretical prediction methods for complex blade shapes designed for low noise at Mach = 0.8 flight and on comparisons with experimental test results.

Noise transmission experiments using a 168 cm. diameter aircraft fuselage model and scaled heavy-double-wall treatments indicate that the treatments perform well and that the predictions are usually conservative. Studies of subjective comfort response in an anechoic environment are described for noise signatures having combinations of broadband and propeller-type tone components. (Author)

A82-35019 # An experimental investigation of S-duct diffusers for high-speed propfans. B. H. Little, Jr. and W. S. Trimboli (Lockheed-Georgia Co., Marietta, GA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1123.* 9 p.

Wind tunnel test results are presented for three propfan engine installation diffuser configurations of the S-duct type, of which two were single-scoop designs having diffuser inlet throat/diffuser exit area ratios of 1.0 and 1.25, and the third, wrap-around design had a 1.25 area ratio. Of the two diffusers with a 1.25 area ratio, the wrap-around design performed better than a shaft-penetrating S-duct in both pressure recovery and static pressure rise, although the thickening of the inlet boundary layer to simulate measured propfan test profiles produced a 2% loss in total pressure recovery and increased distortion parameters several-fold for this design. Duct cross-sectional area distribution discontinuities inherent in simple drive shaft geometries were found to have no effect on diffuser performance. O.C.

A82-35020 # Selecting the best reduction gear concept for prop-fan propulsion systems. J. Godston (United Technologies Corp., Commercial Products Div., East Hartford, CT) and J. Kish (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1124.* 12 p. 8 refs.

A study of reduction gearboxes for application to prop-fan propulsion systems is presented in which 10 different reduction gear configurations are considered. Attention is given to the definition of gearbox technical requirements and of the screening process used in the selection of the more promising concepts. A detailed presentation is made of two typical prop-fan propulsion systems, of which one incorporates an in-line and the other an offset reduction gearbox. The inline systems studied are the splined and integral split path, star/star, compound planetary, layshaft, and planetary/planetary. Offset systems include the spur/-star, spur/planetary, compound idler, and spur/spur. These are evaluated with respect to cruise efficiency, internal or external pitch control, reliability, maintainability, weight, cost, degree of risk, acoustics, and degrees of component contrarotation and ease of scaling. O.C.

A82-35021 # Optimization of propeller blade shape by an analytical method. L. K. Chang and J. P. Sullivan (Purdue University, West Lafayette, IN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1125.* 6 p. 12 refs.

Based upon the vortex lattice method and nonlinear programming procedures, the problem of predicting the optimum propeller-blade shape has been formulated and solved by maximizing the propulsive efficiency under the constraint of constant power consumption. The predicted optimum propeller blades with tip devices (proplets) show an ideal efficiency improvement of 1-6%. Comparisons of the angle of twist distributions for the optimized and unoptimized propeller blades are presented. (Author)

A82-35022 # PMUX - The interface for engine data to AIDS. J. A. Bluish and W. Lorenz (Bendix Corp., Energy Controls Div., South Bend, IN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1127.* 10 p.

The propulsion multiplexer (PMUX) unit, a new component of the Aircraft Integrated Data System (AIDS), promises to improve the accuracy and reduce the weight of condition-monitoring equipment in commercial engines. PMUX will improve accuracy by packaging advanced technology pressure sensors within the electronic unit and by using digital signal conditioning - made more practical by placing the microprocessor near the engine sensors. To reduce weight, the PMUX system will replace multiconductor cables with a serial digital data link. This paper discusses typical design requirements and describes the approach used in a PMUX unit designed for the 747 Extended Upper Deck (EUD) aircraft. (Author)

A82-35023 # Charting propulsion's future - The ATES results. A. Adams and S. Parkola (United Technologies Corp., Government Products Div., West Palm Beach, FL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1139.* 10 p. 5 refs. Contract No. N00019-80-C-0225.

The Advanced Technology Engine Studies (ATES) program was conducted to establish a coordinated government/industry long range propulsion plan for new aircraft systems envisioned through the year 2010. This paper presents results obtained in support of this long range planning effort. These efforts identified optimum engine design requirements (e.g. size, cycle, duty cycle, and maintenance goals), high payoff advanced technologies and engine development-/qualification plans for 15 specific fighter, bomber, transport and V/STOL weapon systems under investigation. The elements of the long range plan were selected to minimize the life cycle cost of future weapon systems while at the same time providing the engine performance necessary to meet advanced weapon system combat requirements. (Author)

A82-35024 # A methodology for planning a cost effective engine development. W. S. Willis (General Electric Co., Evendale, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1140.* 7 p.

The Advanced Tactical Attack Manned System (ATAMS) was chosen as a subject for an advanced technology engine study, whose objective was the development of a life cycle cost methodology for the exploration of alternative propulsion system design and development approaches. Development schedules were evaluated with respect to their impact on product reliability, durability and life cycle cost, for the case of a mixed flow augmented turbofan with 17,150-lb thrust rating, after consideration of this engine's estimated life cycle cost breakdown, failure rate models, operating and support cost breakdown, and relative development cost dependence on quality of testing. A long range propulsion development plan is suggested in light of study results. O.C.

A82-35025 # Propulsion system requirements for advanced fighter aircraft. J. H. Kamman and D. C. Perryman (McDonnell Aircraft Co., St. Louis, MO). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1143.* 9 p.

The mission requirements stipulated for the next generation of Air Force and Navy fighter aircraft suggest the design characteristics and performance capabilities needed in a new engine. Engine cycle optimizations have been performed with reference to both system life cycle cost and takeoff gross weight, in view of primary and alternate missions. Parametric sensitivity results indicate the relative impact of both the primary engine cycle variables and the various mission segments envisaged on aircraft takeoff gross weight. The fighter aircraft considered are an Air Force air superiority configuration in the 40,000-lb weight class, with a 300-nautical mile mission radius, and a 50,000-lb weight class Navy combat air patrol mission configuration with a 200-nautical mile combat radius. Attention is given to the penalties of using derivatives of existing engines, as well as an engine development timetable spanning the period from mid-1982 to 1993. D.C.

A82-35041 * # Evaluation of fuel injection configurations to control carbon and soot formation in small GT combustors. T. J. Rosfjord (United Technologies Research Center, East Hartford, CT) and D. Briehl (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1175.* 12 p. 6 refs.

An experimental program to investigate hardware configurations which attempt to minimize carbon formation and soot production without sacrificing performance in small gas turbine combustors has been conducted at the United Technologies Research Center. Four fuel injectors, embodying either airblast atomization, pressure atomization, or fuel vaporization techniques, were combined with nozzle air swirlers and injector sheaths, and evaluated at test conditions which included and extended beyond standard small gas turbine combustor operation. Extensive testing was accomplished with configurations embodying either a spill return or a T-vaporizer injector. Minimal carbon deposits were observed on the spill return nozzle for tests using either Jet A or ERBS test fuel. A more extensive film of soft carbon was observed on the vaporizer after operation at standard engine conditions, with large carbonaceous growths forming on the device during off-design operation at low combustor inlet temperature. Test results indicated that smoke emission levels depended on the combustor fluid mechanics (especially the mixing rates near the injector), the atomization quality of the injector and the fuel hydrogen content. (Author)

A82-35044 # Small turbine engine augmentor design methodology. T. E. Kuhn, H. C. Mongia, T. W. Bruce (Garrett Turbine Engine Co., Phoenix, AZ), and E. Buchanan (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1179.* 8 p. 14 refs.

This paper describes a design technique based on the use of semianalytical methods, along with a multidimensional aerothermal analysis that has been developed for application to small thrust-class engines. Partial validation of the technique is presented, utilizing existing data on spray injection and flow characteristics around typical flameholders. This improved technique has been used to design an augmentor for a small gas turbine engine in a thrust class of less than 1000 pounds. Typical predictions of internal profiles of fuel/air ratio, temperature, velocity, and combustion efficiency are presented for the final configuration selected for the afterburner. (Author)

A82-35045 # The F404 development program - A new approach. G. C. Rapp (General Electric Co., Lynn, MA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1180.* 14 p.

The experience gained during more than 10 years of F404 engine development is summarized. To achieve maximum results, engine objectives must be clearly defined to permit major design decisions and trade-offs during the initial design

A82-35454 # Investigation of the transonic calibration characteristics of turbine static pressure probes. R. W. Langford, K. R. Keeley, and N. B. Wood (Central Electricity Generating Board, Central Electricity Research Laboratories, Leatherhead, Surrey, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-280.* 9 p. 12 refs. Members, $2.00; nonmembers, $4.00.

Measurement of static pressure in transonic turbines is made difficult because of the need to use probes with substantial support stems in the measurement plane, enabling them to traverse in the confined axial spaces between blade rows. Problems arise because of shock interactions with the probes and the close proximity of shock-reflecting surfaces. Tests show that the calibration can depend on the proportion of probe support immersed in the transonic flow. The wind tunnel gives only partial representation of the turbine transonic flow field, but by using turbine measured and computed static pressures the most representative calibration is selected. (Author)

A82-35455 # Solution to a bistable vibration problem using a plain, uncentralized squeeze film damper bearing. J. A. Palladino and T. W. Gray (General Electric Co., Aircraft Engine Business Group, Lynn, MA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-281.* 9 p. 5 refs. Members, $2.00; nonmembers, $4.00.

A study was carried out to investigate vibration related problems, namely cabin noise and high engine vibration levels, encountered during service introduction of an upgraded turbojet engine having a three-bearing support system with an overhung turbine. The problem was found to be due to an interaction between a rotor mode and a stator mode through bearing clearance, and it was proposed to use a plain, uncentralized, squeeze film damper to lower the turbine rotor critical speed and to eliminate the interaction between the rotor and stator modes. It is shown that with this design, the turbine critical speed is reduced to 25-30% of the rate speed, corresponding to a 50% reduction in the critical speed, and eliminates the bistable vibration. The effects of the exhaust system weight on the engine vibration and cabin noise are also discussed. V.L.

A82-35456 * # Structural dynamics of shroudless, hollow, fan blades with composite in-lays. R. A. Aiello, M. S. Hirschbein, and C. C. Chamis (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-284.* 7 p. Members, $2.00; nonmembers, $4.00. (Previously announced in STAR as N82-22266)

A82-35457 # The effect of journal misalignment on the oil-film forces generated in a squeeze-film damper. R. A. Cookson (Cranfield Institute of Technology, Cranfield, Beds., England), X. H. Feng (Chinese Aeronautical Establishment, Aero-Gas Turbine Research Institute, Beijing, People's Republic of China), and S. S. Kossa (Military Technical College, Cairo, Egypt). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-285.* 5 p. 8 refs. Members, $2.00; nonmembers, $4.00.

The effect of journal misalignment in a two-land, squeeze-film damper on the oil-film pressure distribution and the resulting oil-film forces is investigated using a finite-difference technique implemented in a FORTRAN 1V computer program. It is found that the effect of misalignment can lead to a significant increase in the transmission of unbalance force through the oil film. This effect becomes more pronounced in the case of large ratio of land-length to radial clearance, large level of unbalance, or large bearing orbit. Although at this stage there is no clear indication of the range of operating conditions wherein allowance for misalignment should be made, a threshold of 0.0005 radians has been adopted in a current theoretical study into the effectiveness of uncentralized squeeze-film dampers. V.L.

A82-35462 * # Engine dynamic analysis with general nonlinear finite element codes. II - Bearing element implementation, overall numerical characteristics and benchmarking. J. Padovan, M. Adams, P. Lam (Akron, University, Akron, OH), D. Fertis, and I. Zeid (Northeastern University, Boston, MA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-292.* 9 p. 12 refs. Members, $2.00; nonmembers, $4.00. Grant No. NsG-3283.

Second-year efforts within a three-year study to develop and extend finite element (FE) methodology to efficiently handle the transient/steady state response of rotor-bearing-stator structure associated with gas turbine engines are outlined. The two main areas aim at (1) implanting the squeeze film damper element into a general purpose FE code for testing and evaluation; and (2) determining the numerical characteristics of the FE-generated rotor-bearing-stator simulation scheme. The governing FE field equations are set out and the solution methodology is presented. The choice of ADINA as the general-purpose FE code is explained, and the numerical operational characteristics of the direct integration approach of FE-generated rotor-bearing-stator simulations is determined, including benchmarking, comparison of explicit vs. implicit methodologies of direct integration, and demonstration problems. C.D.

A82-35463 # Ceramic turbine housings. A. F. McLean (Ford Motor Co., Dearborn, MI). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-293.* 10 p. 12 refs. Members, $2.00; nonmembers, $4.00. Research supported by the U.S. Department of Energy and DARPA.

A development program aimed at the application of ceramics to automotive gas turbine engine inner housings is described. After a review of the design concepts considered, and the comparison of candidate ceramic designs with conventional sheet metal or cast iron structures for internal hot gas transition ducts, consideration of the properties of reaction bonded silicon nitride, reaction bonded silicon carbide, and lithium aluminum silicate (LAS) led to the selection of LAS because of its low bulk thermal expansion characteristics. Forming processes such as slip casting and glass forming are considered, along with thermal and mechanical problems that inhere in such large ceramic components. The performance potential of ceramic turbine housings is established in light of the engine and rig tests evaluated. O.C.

A82-35465 # A procedure for evaluating fuel composition effects on combustor life. H. L. Foltz and M. J. Kenworthy (General Electric Co., Advanced Engineering and Technology Programs Dept., Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-296.* 6 p. 6 refs. Members, $2.00; nonmembers, $4.00. Contract No. N00140-80-C-2269.

A generalized method is presented for estimating the effects of fuel composition on liner life. This method avoids the detailed temperature and stress distribution calculations required when using conventional cyclic material property charts. The simplified approach became possible when it was found that cyclic life ratios due to fuel change were very similar when correlated with a convenient temperature parameter that had already been used in the past to correlate fuel composition with metal temperature change. This life ratio was found to be relatively independent of: (1) the peak temperature existing with the base fuel; (2) the coolant temperature; and (3) the actual detailed stress calculation. A trend of increased life ratio effect at longer cyclic lives for crack initiation was found. This trend can be incorporated into life ratio estimates from the prepared curves by using the actual observed service life without the need for a calculated absolute life. (Author)

A82-35469 # Heat transfer optimised turbine rotor blades - An experimental study using transient techniques. J. H. Nicholson, A. E. Forest (Rolls-Royce, Ltd., Derby, England), M. L. G. Oldfield, and D. L. Schultz (Oxford University, Oxford, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-304.* 11 p. 10 refs. Members, $2.00; nonmembers, $4.00.

Conventionally, high pressure turbine blading is optimized for aerodynamic performance without any film cooling applied to the surfaces of the blades. It is considered that modern boundary layer prediction techniques are now sufficiently accurate to allow the heat transfer to be considered at the profile design stage. Two turbine rotor profiles were designed, each with a heat-transfer-optimised pressure surface, and a detailed experimental study using transient techniques in the Oxford cascade tunnel was made. The results show that significant reductions in pressure surface heat transfer can be achieved by boundary layer optimization without compromising the aerodynamic efficiency of the blades. A description of the profiles is given, together with transfer rate measurements, pressure distribution, and aerodynamic loss measurements (a technique developed to measure aerodynamic loss in a transient cascade is described) and flow visualisation photographs. (Author)

A82-35470 # The effect of temperature ratios on the film cooling process. P. J. Loftus and T. V. Jones (Oxford University, Oxford, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-305.* 6 p. 11 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Rolls-Royce, Ltd. and Ministry of Defence (Procurement Executive) of England.

Film cooling experiments have been conducted at conditions which realistically simulate gas turbine environment. Heat transfer has been measured using a short duration wind tunnel. Mainstream injection and wall temperatures have been varied independently in order to conduct a systematic investigation of the injection process. A model of the film cooling process based on the principle of superposition is used to interpret the experimental results. The effect of gas to wall temperature ratio on heat transfer to an uncooled plate has also been investigated. (Author)

A82-35479 # Technology advancements for energy efficient aircraft engines. R. W. Bucy (General Electric Co., Cincinnati, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1051.* 9 p. 9 refs.

The rapid increase in fuel costs since 1973 has been a major influence on the economics of the commercial aircraft fleet. The development of more fuel efficient aircraft engines has, therefore, become an important priority for aircraft engine manufacturers and NASA. Major goals of a program designed to achieve better fuel efficiency include, relative to the CF6-50C reference engine, 12% reduction in installed Specific Fuel Consumption (SFC), 5% reduction in Direct Operating Costs (DOC), and 50% reduction in the SFC deterioration rate in commercial service. A description is presented of the progress made, in connection with the considered program, over the past four and one-half years. Attention is given to component and engine development tests, the fan component test, high pressure compressor component tests, combustor component tests, high and low pressure turbine component tests, and overall systems integration. G.R.

A82-35555 # Commercial transports - Aerodynamic design for cruise performance efficiency. F. T. Lynch (Douglas Aircraft Co., Long Beach, CA). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 81-147. 35 refs.

After a preliminary discussion of basic differences in the transonic flow problems addressed by designers of military aircraft and commercial transports in their efforts to increase cruise performance efficiency, the cruise drag efficiency of existing commercial transport aircraft are examined to determine areas for intensive future development. It is shown that, in order to permit the development of computational design procedures for the accurate calculation of three-dimensional swept wing drag and buffet-onset characteristics, collaboration is needed between developers of transonic potential flow techniques and viscous and inviscid-viscous interaction techniques. In addition, exploitation of the high Reynolds number capability of the National Transonic Facility requires additional development of instrumentation and of testing techniques aimed at flow visualization. O.C.

A82-35556 # Practical aerodynamic problems - Military aircraft. R. G. Bradley (General Dynamics Corp., Fort Worth, TX). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 149-187. 28 refs.

The compromises required by tactical military aircraft design, because of the multiple design point requirements associated with missions which require good low-speed efficiency, and both transonic and supersonic cruise and maneuver characteristics, are discussed for the case of such existing aircraft as the F-16 and similar experimental aircraft. It is shown that the wing design of tactical aircraft is heavily influenced by supersonic requirements for minimum thickness and low camber. It is suggested that the development of methods for the analytical design of wings relying on simple leading and trailing edge flaps in transonic maneuvers be emphasized. It is noted that aeroelastic tailoring is a valuable tool in providing favorable camber and twist for thin-winged fighter configurations, and that analytical methods for the calculation of operational store loads and separation trajectories are not satisfactory in the transonic regime. O.C.

A82-35557 # Experimental testing at transonic speeds. J. A. Blackwell, Jr. (Lockheed-Georgia Co., Marietta, GA). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 189-238. 30 refs.

The process of experimental design for wind tunnel tests of aircraft configurations and components at transonic speeds are explored, along with suggestions for the solutions of problems encountered in experimental testing. Accounting for uncontrollable variables such as the wall effect, through computational allowances, model sizing, and streamlined tunnel walls is described. The tailoring of models for trials is examined for cases of basic research, concept development, code verification, configuration development, and production aircraft models. Minimization of model support systems' flow interference is discussed for wall mounts and sting mounts, as well as for power plant configurations. Finally, methods of accurately producing scaled-down Reynolds number flows which will retain their applicability to the real world are detailed. M.S.K.

A82-35560 # Transonic design using computational aerodynamics. M. E. Lores and B. L. Hinson (Lockheed-Georgia Co., Marietta, GA). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 377-402. 16 refs.

Design methods for improving aircraft performance in transonic regimes are reviewed in terms of inverse solution and numerical optimization methods. Inverse schemes involve computation of the surface velocity potential from surface pressures to obtain a Dirichlet boundary condition. A geometry is then developed by solving a potential flow equation and integration of a tangential flow equation. Weaknesses of the method are discussed, noting the inverse methods are useful for initial wing design. Numerical optimization requires choice of a starting geometry, defining the design objective, and then specifying the constraints. The design proceeds in a series of searches in which variables are perturbed to test the effects on the design objectives and constraints. An example of the numerical optimization of a C-141B to include a 0.03 increase in the Mach cruise speed is presented. M.S.K.

A82-35561 # Application of computational methods to transonic wing-design. I. C. Bhateley and R. A. Cox (General Dynamics Corp., Fort Worth, TX). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 405-430. 23 refs.

Available transonic computational methods for wing design are examined and examples are provided. The governing equations, differencing techniques, geometry modeled, the necessity for viscous corrections, and the Mach number range of presently used computer codes are detailed. The schemes considered include the Bailey-Ballhaus, Pandora-Boppe, Jameson FLO-22 Caughey, the Jameson FLO-27 Caughey, and the advanced Jameson FLO-28/30 codes. Design techniques which employ one or several codes for the simulation of aircraft components or combinations of components in a transonic flow regime are outlined. Specific examples are made of a trainer wing refinement, and an advanced fighter flap design. The codes are concluded to be deficient in treating complex configurations such as fuselages, and also to require large amounts of computational time. M.S.K.

A82-35562 # A-7 transonic wing designs. H. P. Haney (Lockheed-Georgia Co. Marietta, GA). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 431-450. 10 refs.

The problems encountered in applying available computer codes to the computational design of new wings for the A-7 aircraft are reported. The Navy and NASA performed the study in the period 1976-1980 to correlate the FLO-22 code wing analysis with wind tunnel data, to optimize transonic airfoils, numerically optimize wing design, design two different wings for different criteria, wind tunnel test the pressure models of the new wings, and compare experimental results with the model predictions. Simulation of the existing A-7 wing by means of the FLO-22 code showed agreement satisfactory enough for the study to proceed. Design constraints on the new airfoil included a 0.4 lift coefficient and 0.78 Mach number. It was found that only a few of 25 design variables could be used in each wing section, thereby requiring rerunning the code for each variable when gradients were needed. Correlations drawn from wind tunnel tests were concluded unsatisfactory for optimization purposes. M.S.K.

A82-35563 # Transonic computational experience for advanced tactical aircraft. E. Bonner and P. B. Gingrich (Rockwell International Corp., Aircraft Group, Los Angeles, CA). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 451-465. 10 refs.

Three-dimensional transonic numerical analysis performed for the HiMAT and FSW wing definition is described, along with comparisons with experimental results. HiMAT maneuver wings were analyzed with the Bailey-Ballhaus classical small disturbance theory, which was found to predict the entire upper surface flow after modifications of the Karman-Guderly transonic small disturbance equation. Multiple surface interactions are noted to be necessarily studied instead of in isolated components at subsonic and supersonic speeds. An approximate procedure was found for changing the wing twist to account for the canard downwash, and a full potential assessment is presented, along with comparisons for a near maneuver condition of Mach 0.9 at an angle of attack of 10 deg. Forward swept wing analysis is discussed, noting that test results were not well predicted by small disturbance or full potential analysis. M.S.K.

A82-35564 # Extension of FLO codes to transonic flow prediction for fighter configurations. A. Verhoff and P. J. O'Neil (McDonnell Aircraft Co., St. Louis, MO). In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 467-487. 11 refs. Research supported by the McDonnell Douglas Independent Research and Development Program.

The applications of FLO and equivalent simple body (ESB) computer codes to simulating transonic behavior of various fighter aircraft are described. The ESB program is employed to model complex geometries such as the wing/fuselage combination using a panel method. The models are valid at small angles of attack and linear and Mach independent, thereby suitable for the transonic regime. When employed with the FLO codes, the ESB technique allows determination of the perturbation velocity distributions of a complex fuselage. Correlations are then available for FLO code results at subcritical Mach numbers, and the FLO program can be used for transonic regimes. The results of applications to the F-15 geometry are presented, and further use for modeling the F/A-18, the rectangular wings by making chordwise and compressibility corrections is extended to cover wings of any arbitrary planform in subsonic and supersonic flows. The numerical accuracy of the present work is better than that of the Lomax-Sluder results. Comparison of the results of this work with those of the vortex-lattice method and Kernel function method for a family of Gothic and arrowhead wings shows good agreement. A universal curve is proposed for the evaluation of the lift coefficient of a low aspect ratio wing of an arbitrary planform in subsonic flow. The location of the center of pressure can also be estimated. (Author)

A82-37945 # Static and aeroelastic optimization of aircraft (Optimisation statique et aéroélastique des avions). J. M. Thomas (Société Nationale Industrielle Aérospatiale, Toulouse, France). *Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Aeroelasticity, Nuremberg, West Germany, Oct. 5-7, 1981, Paper.* 9 p. In French.

Techniques for the finite element modeling of the static and aeroelastic stresses on an aircraft are described. The methods are intended to serve to define sustainable loads in aircraft structures which are built with minimized weight. Attention is focussed on the components of the ASELF program, which comprises analyses of linear and nonlinear statics, crack propagation, thermal effects and static and dynamic aeroelastic characteristics. Partial derivatives are obtained for the displacements, elastic, principal, and equivalent stresses, the rupture criteria, panel buckling, and internal interactions between groups of elements. Constraints are placed on the optimization through formulation of the displacements, a rigidity matrix, and a determination of the external stresses. An optimization example is provided for a composite sheets bordering openings in the aircraft or in the empennage using 1952 degrees of freedom with 3684 elements. M.S.K.

A82-37946 # Survey of active and passive means to reduce rotorcraft vibrations. G. Reichert and H. Strehlow (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Aeroelasticity, Nuremberg, West Germany, Oct. 5-7, 1981, Paper.* 50 p. 56 refs.

Methods employed and proposed for reducing rotorcraft vibrations are reviewed, with attention given to development and test programs. Active vibration isolators such as force generators, springs, and dampers are noted to possess advantages over passive systems, due to the ability to supply variable power, to react to many variables in a local force, and modifiability to meet performance specifications. Sources of rotorcraft vibrations are identified, along with options for controlling the vibrations, structural tuning, dynamic absorbers in the rotating and nonrotating system, rotor isolation, and multicyclic pitch or twist control. The underlying principle is compensation, enacted by producing harmonic forces to offset disturbances. The use of passive antiresonant force isolators as connecting members between the rotor-transmission unit and the fuselage is discussed as an effective combination of spring passive force generator. M.S.K.

A82-37947 F-16 active flutter suppression program. R. P. Peloubet, Jr., R. L. Haller, and R. M. Bolding (General Dynamics Corp., Fort Worth, TX). *Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Aeroelasticity, Nuremberg, West Germany, Oct. 5-7, 1981, Paper.* 14 p. 12 refs. Contracts No. F33615-77-C-3081; No. F33615-80-C-3210.

The F-16 military aircraft is required to carry a very large number of external store configurations, and new store configurations are continuously being added to its inventory. Therefore, the probability increases that eventually store configurations might be added which would cause wing/store flutter that could not be easily stabilized by passive means. The F-16 flutter suppression program has the objective to develop the technology for a flutter suppression system (FSS) which could be employed in case such stabilization difficulties with the F-16 should occur. Attention is given to an overview of an F-16 FSS feasibility study, a description of an analog study of a technique for measuring the FSS open-loop frequency response functions (FRF) during wind tunnel tests, a description of wind tunnel tests of the F-16 flutter suppression model which were conducted from 27 January through 8 February 1979, and planned wind tunnel tests to be conducted during the fall of 1981. G.R.

A82-37969 USAF ACES II progress report. R. C. Delgado (USAF, Air Force Inspection and Safety Center, Norton AFB, CA). *SAFE Journal*, vol. 12, Summer 1982, p. 10-12.

A review of the operational experience for the Advanced Concept Ejection Seat (ACES II), in operational use in USAF aircraft since 1978, is presented. The ejection survival rate using the ACES II (83%) exceeds the rate for other USAF escape systems (74%). Moreover, none of the fatalities can be attributed to the ACES II seat. In addition, the major injury rate for the ACES II was only 4%, compared to others' 17%. A series of tables providing injury definitions as well as statistical data (ejection speed, ejection altitude, etc.) are presented. N.B.

A82-37970 Lear Fan 2100 egress system. D. W. Newton (Lear Fan Corp., Reno, NV). *SAFE Journal*, vol. 12, Summer 1982, p. 18-22.

This paper describes the crew emergency egress system developed and installed on the Lear Fan 2100 flight test prototype. The unique configuration of the airplane, which includes a large Y tail and aft mounted propeller, required development of a method of escape which would assure positive clearance of crewmembers from the airframe during a bailout. The total system which was developed includes an explosive door removal system, a crewmember rocket extraction system, and a seat mover system to transport the crewmember to the escape opening. The philosophy which led the company to develop this particular system, together with its advantages and limitations, is discussed. The system is unique in general aviation aircraft, and represents a considerable advancement in emergency escape capability for such aircraft. Extensive testing of the system, including explosive cutting tests of the graphite/epoxy airframe structural members, a stationary test of the extraction system, and a 350 knot jet sled test, was conducted and is described. (Author)

A82-37972 # Strategic materials - Technological trends. A. Hurlich. *Mechanical Engineering*, vol. 104, July 1982, p. 44-53. 5 refs.

The US is becoming increasingly dependent upon other countries for sources of strategic materials - raw materials such as cobalt, aluminum, manganese and chromium needed to supply military, industrial and civilian needs during a national emergency and found domestically in insufficient quantities. Various ways of reducing the US vulnerability in these strategic materials are reviewed, emphasizing technological methods to reduce consumption. The use of recycling, scrap recovery and conversation methods is expanding, but these efforts are insufficient. Another approach is to develop materials management programs, such as devising lists of alternative materials that may be used in case the normally used materials become unavailable, and strategic planning to limit the use of critical materials that may pose serious problems if their supply is interrupted. New materials and technologies are being developed and tested to reduce as much as possible the use of strategic materials - such as reducing the amount of chromium in certain stainless steels from 12-18% to 2-6%. The use of near net shape technology also can save large amounts of materials by eliminating trimming waste. Investigation and development of possible substitutes for strategic materials are now being conducted by government agencies and private industry. Finally, stockpiling is mentioned as a way to ensure adequate supplies when no substitutes are available. N.B.

A82-38025 The recognition of air worthiness of aircraft - Comments to a remarkable judicial decision (Zur Anerkennung der Lufttüchtigkeit von Flugzeugen - Bemerkungen zu einem bemerkenswerten Urteil). A. Rudolf. *Zeitschrift für Luft- und Weltraumrecht*, vol. 31, June 1982, p. 124-128. 15 refs. In German.

A judicial decision made by the U.S. Court of Appeals is discussed, taking into consideration the question whether a German judge might have arrived at the same decision as the American judge, and the legal consequences of such a decision. The considered decision is related to a complaint filed by foreign airlines with respect to an act of the Federal Aviation Agency (FAA). After an aircraft accident involving the loss of a U.S. DC-10 airliner on May 25, 1979, at Chicago, the FAA had prohibited for U.S. airspace the operation of all DC-10 aircraft, including those registered in foreign countries. The plaintiffs maintain that this act would constitute a violation of Article 33 of the Chicago Convention, which, in its turn, would violate Paragraph 1102 FAAct. The Court agreed with the plaintiffs. G.R.

A82-38077 * Development and validation of preliminary analytical models for aircraft interior noise prediction. L. D. Pope, D. C. Rennison (Bolt Beranek and Newman, Inc., Canoga Park, CA), C. M. Willis, and W. H. Mayes (NASA, Langley Research Center, Hampton, VA). *Journal of Sound and Vibration*, vol. 82, June 22, 1982, p. 541-575. 19 refs. Contract No. NAS1-15782.

Predictions are made of the transmission of sound into an unpressurized and unstiffened cylinder under random and harmonic excitations, in order to validate the preliminary version of an airplane interior noise prediction model which is based on an analysis of the power flow type. The predictions are compared to experimental results, and statistically significant differences between predictions and measurements are found to be primarily due to input data deficiencies. Because the model requires only the value of a simple integral for determining interior spatial coupling, and resonance frequencies to determine frequency coupling, the known dynamics of the fuselage can be utilized without difficulty. O.C.

STAR ENTRIES

N82-26199*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
JOINT UNIVERSITY PROGRAM AIR FOR TRANSPORTATION RESEARCH, 1981
Jun. 1982 235 p refs Proc. of a Conf. held at Washington, D.C., 11 Dec. 1981
(Grants NGL-22-009-640; NGR-36-009-017; NGL-31-001-252)
(NASA-CP-2224; L-15346; NAS 1.55:2224) Avail: NTIS HC A11/MF A01 CSCL 01B

Navigation, guidance, control and display concepts, and hardware, with special emphasis on applications to general aviation aircraft are discussed.

N82-26200*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
DYNAMIC SCHEDULING OF RUNWAY OPERATIONS
John Pararas *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 7-13

Avail: NTIS HC A11/MF A01 CSCL 01C

Automated ATM/C decision making is discussed. Runway scheduling and flight plan generator algorithms are considered. Terminal area geometry, ATM/C schematics, vector controller display and simulation work are reported. N.W.

N82-26201*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
PPOD PROGRAMMABLE PILOT-ORIENTED DISPLAY
Antonio L. Elias *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 15-30
Avail: NTIS HC A11/MF A01 CSCL 01D

A general-purpose low cost research microprocessor system for general aviation was developed. This system is intended to be the vehicle for individual research efforts in low cost airborne hardware and software as well as advanced microprocessor based navigation systems and techniques. Two such research projects were undertaken, yielding results in the areas of micro hardware/software design, cost and performance, and pilot/computer interface. Low-cost flight software reliability and a time-difference based Loran approach procedure that eliminates the need for propagation corrections and latitude/longitude transformations are also discussed. Author

N82-26202*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
THE P-POD PROJECT Progress Report
James A. Littlefield *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 31-37
Avail: NTIS HC A11/MF A01 CSCL 01D

The programmable pilot oriented display (P-POD), a multiprocessor based flight information processing and display unit, is discussed. Communication protocols between the three Z-80 processors inside P-POD are reviewed. The interface between the video processor, P2, and the main processor, P1, was tested. Hardware and software were revised. Data flow between P1 and P2 is illustrated. While running diagnostic routines to exercise the P1/P2 interface at maximum speed an intermittent failure was observed. A check of possible noise sources or race conditions in the hardware did not reveal the source of this failure. Possible software timing problems were also fully investigated. To eliminate the effects of this type of failure a performance monitor routine was used to detect these occasional failures and correct them. The data transmission cycle between P1/P2 is either allowed to continue normal operation or is re-initialized and restarted when an error is detected. N.W.

N82-26203*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
MICROWAVE ICE PREVENTION
R. John Hansman, Jr. and Walter Hollister *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 39-51

Avail: NTIS HC A11/MF A01 CSCL 01C

The concept of using microwave energy to provide aircraft ice protection, specifically an anti-icing system, and the feasibility of such a system are discussed. In a microwave anti-icing system impinging supercooled water droplets are heated to above freezing by the resonant absorption of microwave energy located upstream of the aircraft. This process is inherently more efficient than existing anti-icing devices due to the saving of the latent heat of fusion (a substantial 334 joules/gm (80 cal/gm)) and the fact that only the droplets are heated, thereby reducing convective losses to the air. Author

N82-26204*# Ohio Univ., Athens. Avionics Engineering Center.
INVESTIGATION OF AIR TRANSPORTATION TECHNOLOGY AT OHIO UNIVERSITY, 1981
Richard H. McFarland *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 55-72 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

The increased availability of Loran signals in the United States encouraged consideration of Loran for airborne applications. High quality ignal processing to obtain effective signal-to-noise ratios which permit good reliability in position determination consistent with airborne applications is considered. Techniques for deriving air navigation quality information from Loran-C were investigated. N.W.

N82-26206*# Ohio Univ., Athens. Avionics Engineering Center.
LORAN-C PLOTTING PROGRAM FOR PLOTTING LINES OF POSITION ON STANDARD CHARTS
James P. Roman *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 93-114 ref
Avail: NTIS HC A11/MF A01 CSCL 17G

A set of programs designed to be run on the IBM System/370 computer is described. These programs are used to plot Loran-C lines of position (LOP) on any common map or standard aviation sectional chart. The Loran-C plotting program JRPLOT FORTRAN uses a standard Calcomp-compatible plotting subroutine package for the Hewlett-Packard 7203A graphic plotter. A general description of the features of the Loran-C plotting program. This program involves a simple add/substrate method to calculate the LOP. A description on how to use the program and some methods of operation are included. Author

N82-26207*# Ohio Univ., Athens. Avionics Engineering Center.
A LORAN-C PROTOTYPE NAVIGATION RECEIVER FOR GENERAL AVIATION
Robert W. Lilley and Daryl L. McCall *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 115-137 refs

Avail: NTIS HC A11/MF A01 CSCL 17G

An automatic gain control has been designed and fabricated to operate with the Loran-C prototype receiver and data collection system. Author

N82-26208*# Ohio Univ., Athens. Dept. of Electrical Engineering.
A LORAN-C PROTOTYPE NAVIGATION RECEIVER FOR GENERAL AVIATION
Robert W. Lilley and Daryl L. McCall *In* NASA. Langley Research Centeer Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 121-137 refs

Avail: NTIS HC A11/MF A01 CSCL 17G

The design, fabrication and evaluation of a prototype Loran-C receiver is described. Hardware, and microcomputer programming

VISUAL TECHNOLOGY RESEARCH SIMULATOR, VISUAL AND MOTION SYSTEM DYNAMICS Interim Report, 1978 - 1981
G Blair Browder and Steve K Butrimas Apr 1981 75 p refs
(AD-A111801 NAVTRAEQUIPC-IH-326) Avail NTIS HC A04/MF A01 CSCL 05/9

Simulator system time lags and transport delays can be critical factors in achieving a successful modern trainer This document presents the results of detailed measurements made on the Navy's Visual Technology Research Simulator (VTRS/CTOL) These measurements determined 'end-to-end' dynamic lags, with aircraft control stick as the input stimulus and visual/motion hardware response as the output Major subsystems of the VTRS/CTOL include a T-2C aircraft cockpit, pneumatic G-seat, six degree of freedom motion base, wide angle dome display with a servo-controlled projection system driven with either CIG or closed circuit model board TV Dynamic performance data shows phasing between the motion and visual systems for CIG and model board simulation This study concludes that the VTRS/CTOL simulator throughout lags are less than 150 milliseconds which is generally accepted as satisfactory for simulation Author (GRA)

N82-26326# Federal Aviation Administration, Washington, D C Office of Aviation Policy and Plans
AIRFIELD AND AIRSPACE CAPACITY/DELAY POLICY ANALYSIS
Harvey Safeer, John Rodgers, Lawrence A Pearsall, Stefan Hoffer, Mark Pfeifer, and David DeCarme Dec 1981 59 p refs
(AD-A110777, FAA-APO-81-14) Avail NTIS HC A04/MF A01 CSCL 01/5

A general discussion of the concepts of capacity and delay at airfields and in enroute airspace precedes an estimation of present and future capacity and delay Options to increase capacity and mitigate delay are then reviewed The discussion is pointed towards United States air carrier airports and the users of those airports The most detailed analysis concerns the top 39 air carrier airports and is based on data collection from three major air carriers Potential congestion problems sufficient to impair the efficiency of national transportation are found to be possible at 19 major airports by 1991 Remedies to such congestion are described for 12 airports, but presently known resources are expected to be insufficient to satisfy the potential demand at 7 airports GRA

N82-26350*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala
THE MARSHALL SPACE FLIGHT CENTER KC-135 ZERO GRAVITY TEST PROGRAM FOR FY 1981
R E Shurney ed Mar 1982 69 p refs
(NASA-TM-82476 NAS 1 15 82476) Avail NTIS HC A04/MF A01 CSCL 11G

Seven separate investigations during 23 5 hours of testing aboard the KC-135 zero gravity aircraft were conducted All experiment objectives were met or exceeded Author

N82-26384* National Aeronautics and Space Administration Langley Research Center, Hampton, Va
FUSELAGE STRUCTURE USING ADVANCED TECHNOLOGY FIBER REINFORCED COMPOSITES Patent
Robert K Robinson (Boeing Commercial Airplane Co., Seattle) and Harry M Tomlinson, inventors (to NASA) (Boeing Commercial Airplane Co Seattle) Issued 12 Jan 1982 9 p Filed 16 Feb 1978 Supersedes N78 18045 (16 - 09, p 1111) Sponsored by NASA
(NASA-Case-LAR-11688-1, US-Patent-4,310,132, US-Patent-Appl-SN-878540, US-Patent-Class-244-119, US-Patent-Class-244-123, US-Patent-Class-244-132) Avail US Patent and Trademark Office CSCL 11D

A fuselage structure is described in which the skin is comprised of layers of a matrix fiber reinforced composite, with the stringers reinforced with the same composite material The high strength to weight ratio of the composite, particularly at elevated temperatures, and its high modulus of elasticity, makes it desirable for use in airplane structures

Official Gazette of the U S Patent and Trademark Office

N82-26400# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio Fuels Branch
KOVATS INDICES AS A TOOL IN CHARACTERIZING HYDROCARBON FUELS IN TEMPERATURE PROGRAMMED GLASS CAPILLARY GAS CHROMATOGRAPHY. PART 1: QUALITATIVE IDENTIFICATION Final Report, Dec. 1979 - Sep. 1980
Paul C Hayes, Jr and Edward W Pitzer Nov. 1981 85 p refs
(AF Proj. 3048)
(AD-A111389; AFWAL-TR-81-2102) Avail: NTIS HC A05/MF A01 CSCL 21/4

Kovats Indices are used as a tool to identify the major components of several aircraft jet fuels of the JP-4 type. Glass capillary gas chromatography in the temperature programmed mode was the technique of choice The first phase of the effort involved optimization of the capillary system for the maximum resolution between a selected pair of normal hydrocarbons in an acceptable analysis time Peak resolution was investigated as a function of carrier capillary pressure, temperature programming rate, and initial column temperature. Eleven qualitatively known and quantitatively accurate calibration solutions were prepared to include over 200 different hydrocarbons. Kovats Indices were generated for these solutions in a statistically reliable fashion on two capillary columns of different polarities. Thus, each hydrocarbon standard had its own unique set of two Kovats Indices Several petroleum, as well as shale derived, JP-4 samples were subsequently chromatographed on the same two capillary columns Peaks were given tentative identification by matching of Kovats Indices Author (GRA)

N82-26439*# United Technologies Corp., East Hartford, Conn. Commercial Products Div
HOT ISOSTATICALLY PRESSED MANUFACTURE OF HIGH STRENGTH MERL 76 DISK AND SEAL SHAPES Final Report
R D Eng and D J Evans May 1982 139 p refs
(Contract NAS3-20072)
(NASA-CR-165549; NAS 1 26 165549; PWA/5574-123) Avail: NTIS HC A07/MF A01 CSCL 11F

The feasibility of using MERL 76, an advanced high strength direct hot isostatic pressed powder metallurgy superalloy, as a full scale component in a high technology, long life, commercial turbine engine were demonstrated. The component was a JT9D first stage turbine disk The JT9D disk rim temperature capability was increased by at least 22 C and the weight of JT9D high pressure turbine rotating components was reduced by at least 35 pounds by replacement of forged Superwaspaloy components with hot isostatic pressed (HIP) MERL 76 components. The process control plan and acceptance criteria for manufacture of MERL 76 HIP consolidated components were generated. Disk components were manufactured for spin/burst rig test, experimental engine tests, and design data generation, which established lower design properties including tensile, stress-rupture, 0.2% creep and notched (Kt = 2.5) low cycle fatigue properties, Sonntag, fatigue crack propagation, and low cycle fatigue crack threshold data Direct HIP MERL 76, when compared to conventionally forged Superwaspaloy, is demonstrated to be superior in mechanical properties, increased rim temperature capability, reduced component weight, and reduced material cost by at least 30% based on 1980 costs. J.D.

N82-26446# Dayton Univ., Ohio Research Inst.
RESEARCH AND DEVELOPMENT ON WEAR METAL ANALYSIS Final Report, 16 Mar. 1976 - 20 Jul. 1981
Wendell E. Rhine, Costandy S. Saba, Robert E. Kauffman, John R Brown, and Patricia S Fair Wright-Patterson AFB, Ohio AFWAL Jan 1982 253 p refs
(Contract F33615-76-C-5312; AF Proj 2303)
(AD-A112100; AFWAL-TR-81-4184) Avail: NTIS HC A12/MF A01 CSCL 07/4

Since the reliability of wear metal determinations depends on the integrity of the primary standards used to calibrate the instruments, standards were synthesized and evaluated for use in the Oil Analysis Program (OAP) The standards currently used by the Air Force, in addition to Cannon, metal caprates, metal beta-diketonates, and NBS standards were evaluated for their long term stability. Two state-of-the-art plasma emission instruments were evaluated for their potential applications to the AF OAP The goal of this effort was to improve the particle detection capability of oil analysis instruments. The sample introduction systems used by these instruments could not efficiently transport particles to the plasma sources. However, the dc plasma instrument could analyze particles better than currently used instruments Research was also conducted to identify and characterize wear debris found in typical used turbine engine lubricating oils. Methods were developed to determine the concentration of organometallic, metallic and metal oxide species in oils for Mg, Cu and Fe. An investigation was conducted to determine and recommend optimized atomic absorption procedures for analysis of wear metals in aircraft lubricating oils. Optimization procedures and recommended AA methods are included. A method was developed to determine the 'actual' concentration of wear metals in authentic used aircraft engine oils. It is quantitative for Al, Cr, Cu, Fe, Mg, Mo, Ni, Pb, Sn and Ti metallic particles. GRA

N82-26465*# Rockwell International Corp., Downey, Calif.
DEVELOP, DEMONSTRATE, AND VERIFY LARGE AREA COMPOSITE STRUCTURAL BONDING WITH POLYIMIDE ADHESIVES Final Report
Bashir D. Bhombal, Donald H. Wykes, Keith C. Hong, and Arnold A. Stenersen May 1982 152 p refs
(Contract NAS1-15843)
(NASA-CR-165839; NAS 1.26:165839) Avail: NTIS HC A08/MF A01 CSCL 11A

The technology required to produce graphite-polyimide structural components with operational capability at 598 K (600 F) is considered. A series of polyimide adhesives was screened for mechanical and physical properties and processibility in fabricating large midplane bonded panels and honeycomb sandwich panels in an effort to fabricate a structural test component of the space shuttle aft body flap. From 41 formulations, LaRC-13, FM34B-18, and a modified LaRC-13 adhesive were selected for further evaluation. The LaRC-13 adhesive was rated as the best of the three adhesives in terms of availability, cost, processibility, properties, and ability to produce void fee large area (12' x 12') midplane bonds. Surface treatments and primers for the adhesives were evaluated and processes were developed for the fabrication of honeycomb sandwich panels of very good quality which was evidenced by rupture in the honeycomb core rather than in the facesheet bands on flatwise tensile strength testing. The fabrication of the adhesively bonded honeycomb sandwich cover panels, ribs, and leading edge covers of Celion graphite/LARC-160 polyimide laminates is described. A.R.H.

N82-26483*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTS ON FUEL HEATING FOR COMMERCIAL AIRCRAFT
R. Friedman and F. J. Stockemer (Lockheed-California Co., Burbank, Calif.) 1982 15 p refs Presented at 18th Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; Sponsored by AIAA, SAE and ASME
(NASA-TM-82878; E-1254; NAS 1.15:82878) Avail: NTIS HC A02/MF A01 CSCL 21D

An experimental jet fuel with a -33 C freezing point was chilled in a wing tank simulator with superimposed fuel heating to improve low temperature flowability. Heating consisted of circulating a portion of the fuel to an external heat exchanger and returning the heated fuel to the tank. Flowability was determined by the mass percent of unpumpable fuel (holdup) left in the simulator upon withdrawal of fuel at the conclusion of testing. The study demonstrated that fuel heating is feasible and improves flowability as compared to that of baseline, unheated tests. Delayed heating with initiation when the fuel reaches a prescribed low temperature limit, showed promise of being more efficient than continuous heating. Regardless of the mode or rate of heating, complete flowability (zero holdup) could not be restored by fuel heating. The severe, extreme-day environment imposed by the test caused a very small amount of subfreezing fuel to be retained near the tank surfaces even at high rates of heating. Correlations of flowability established for unheated fuel tests also could be applied to the heated test results if based on boundary-layer temperature or a solid index (subfreezing point) characteristic of the fuel. Author

N82-26484# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Fuels Branch.
JET FUEL FROM SHALE OIL: THE 1981 TECHNOLOGY REVIEW
Herbert R. Lander, Jr. Dec. 1981 257 p refs Proceedings of Symp., Miamisburg, Ohio, 17-18 Nov. 1981
(AF Proj. 3048)
(AD-A111217; AFWAL-TR-81-2135) Avail: NTIS HC A12/MF A01 CSCL 21/4

The 'Jet Fuel From Shale Oil - 1981 Technology Review' culminated three years of Air Force Shale Oil related programs. Final economic optimized results of three processing studies evaluating the yield, cost and quality of JP-4 and JP-8 jet fuel produced from whole crude shale oil are discussed. Reported also are technologies associated with a newly developed nitrogen tolerant catalyst and conclusions of combustion studies performed on shale derived JP-4 jet fuel samples and Nuclear Magnetic Resonance (NMR) analyses of the composition of shale derived jet fuel samples. Author (GRA)

N82-26485# Center for Naval Analyses, Alexandria, Va. Naval Studies Group.
MOBILITY FUELS FOR THE NAVY
Thomas ONeill Jan. 1982 21 p refs
(Contract N00014-76-C-0001)
(AD-A112511; CNA-PP-336) Avail: NTIS HC A02/MF A01 CSCL 21/4

As fuel declines, both specifications and engine designs will have to be modified to accommodate this change. In addition, specifications have to reflect the fact that fuel chemistry itself is undergoing change, so that new problems have begun to arise. Recently, batches of DFM and JP-5 that passed inspection have been associated with fuel filter clogging and excessive smoking. The mechanisms of these effects are not clearly understood. As synfuels are introduced, the variety of chemicals in fuels will be greatly expanded, and this will cause a new range of problems. Besides modifying the specifications of current fuels to address the issues of price and availability, other ways might come from changing the types of fuel burned. The Navy could attempt to switch to fuels in civilian use. Number 2 diesel oil is similar to the ship fuel DFM, while Jet A-1 is not unlike the aircraft fuel JP-5. Another approach could involve the use of just one type of fuel for both ships and airplanes. This would reduce storage and handling costs, perhaps enough to offset the modest differential of 5 cents per gallon between JP-5 and DFM that existed in October 1981. GRA

N82-26487# Southwest Research Inst., San Antonio, Tex. Army Fuels and Lubricants Research Lab.
DEVELOPMENT OF ARMY HIGH-ENERGY FUEL DIESEL/TURBINE-POWERED SURFACE EQUIPMENT, PHASE 2 Interim Report, Oct. 1979 - Sep. 1981
William W. Wimer and D. M. Yost Dec. 1981 134 p refs
(Contracts DAAK70-80-C-0001; DAAK70-82-C-0001; DA Proj. 1L7-62733-AH-20)
(AD-A111942; AFLRL-147) Avail: NTIS HC A07/MF A01 CSCL 21/4

The Army is interested in those fuels that have a high-energy content per unit volume and therefore result in increased payload capabilities and/or extended operational range of the vehicle. A series of screening processes are being used to identify those fuels and/or fuel components that could result in an increase of 10 percent in the range of the vehicle without an increase in the fuel tank size, i.e., fuels with a high-energy content percent volume. The chemical and physical properties of various candidate fuels and fuel components are described. The fuel components included both liquids and solids (at room temperature). The blending of the various components and the characterization of the resulting fuels are outlined. Solubility studies were done on some of the solid components to assist in obtaining the resulting fuel in the more desirable liquid state. Those solid components, such as anthracene, that were insoluble in the tests conducted but judged to have good high-energy potential, were studied as slurries. Catalyzed 'carbon black' was investigated. Settling studies with carbonaceous fuels included the effect of temperature upon the stability, the stability of FRF-carbon slurries, and the refinement of the previously reported 'Freezing Tube Technique' for measuring stability. Impact dispersion tests were conducted to study the fire-safety characteristics of energy-augmented fuels. The screening of candidate fuels with the Petter engine is described in detail. Other engine studies with the CLR engine are also included. Author (GRA)

N82-26490# Department of Energy, Washington, D. C. Office of Transportation Programs.
SYMPOSIUM ON COMMERCIAL AVIATION ENERGY CONSERVATION STRATEGIES, PAPERS AND PRESENTATIONS
Apr. 1981 354 p refs Symp. held in Washington, D.C., 2-3 Apr. 1981 Sponsored in part by FAA
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Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980
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Formability of metallic materials - 2000 A.D.; Proceedings of the Symposium, Chicago, IL, June 24, 25, 1980
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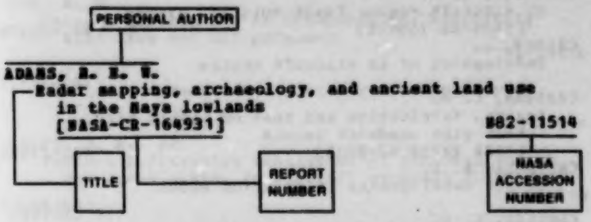

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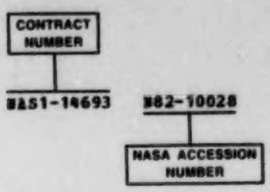

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layouts. The prototype philosophy is considered a low-cost, effective method of demonstrating new engine features and configurations, as well as 'proof of concept'. It is pointed out that when the prototype is used, an adequate time period should be allowed for engine redesign prior to beginning a full-scale development program. Completing aerodynamic development before or shortly after beginning full-scale development permits concentration on the controls system and on durability development without frequent changes. It is also pointed out that the definition of engine failure modes requires a mix of test schedules to probe design sensitivity to various stimuli. C.R.

A82-35046 # Development of engine operability. T. J. Christie (United Technologies Corp., Government Products Div., West Palm Beach, FL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1181.* 11 p.

An important criterion in connection with the selection of an engine for advanced aircraft weapon systems is related to operability. Good operability is the ability of the engine to perform flawlessly in all aspects of the mission. The various areas of engine operability are explored, taking into account potential design solutions for advanced engine systems. Aspects of engine airstarting capability are considered, giving attention to the compressor, the utilization of digital electronic control, and the bearing support system. The engine thrust response is discussed along with the solution of engine stall problems, taking into consideration fan and compressor, the augmentor, and control components. Problems related to the occurrence of nonrecoverable stall are also explored. It is pointed out that to ensure adequate engine operability for the next generation of air superiority fighters, it is imperative to modify the engine development program. The required changes are discussed. G.R.

A82-35047 # Control of gas turbine power transients for improved turbine airfoil durability. R. R. Sellers (United Technologies Corp., Government Products Div., West Palm Beach, FL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1182.* 11 p.

It is noted that today's advanced military fighter engines are demonstrating thrust-to-weight ratios of 8 to 1 and that fighter engine requirements exceeding 10 to 1 are forecast. In practice, this increase in thrust-to-weight ratio has been achieved in large part by increasing the level of the combustor exit temperature. Low cycle fatigue has thus become a lift-limiting factor in turbine airfoils because of this increased combustor exit temperature and the increased number of major throttle transients. A test facility that can provide the engine data base necessary for improving turbine airfoil low-cycle-fatigue life predictions is described. C.R.

A82-35048 # T700 - Modern development test techniques, lessons learned and results. R. A. Dangelmaier (General Electric Co., Aircraft Engine Business Group, Lynn, MA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1183.* 10 p.

The testing of the T700 engine is discussed. The 300-hr model qualification test required the engine to withstand low cycle fatigue cycles, thermal cycles, ingestion of various objects and substances including liquid water, ice, sand, and birds, and to meet hot and cold start criteria. The engine was measured for overtemperature, smoke emission and corrosion susceptibility. Abusive vibration testing, inlet and exhaust system evaluation, and suction fuel system examination was also done. Pre-production engine ground and flight testing was done in a number of aircraft. This was followed by a two-year maturity/life verification program in order to further assure a high level of life, durability, reliability, and maturity at the time of production introduction in 1978. Accelerated endurance and accelerated mission testing was done. Problems uncovered and corrected during the testing are discussed. C.R.

A82-35049 # Next generation trainer /NGT/ engine requirements - An application of lessons learned. C. J. Bauer (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1184.* 7 p.

A new, four-step approach for turbine engine development is described, as well as the new Engine Structural Integrity Program (ENSIP). Instead of the former two-step qualification process including a preliminary flight rating test and a model qualification test, the new concept emphasizes definition and verification of field maintenance procedures and parts life limits. It includes an initial flight release, full flight release, initial service release, and operational capacity release, each of which is briefly described. ENSIP encompasses five tasks: (1) design information; (2) design analysis, component and materials characterization; (3) component and core engine testing; (4) ground and flight testing; and (5) product quality control and engine life management. The integration of the former procedure with the new concept and procedure is discussed. C.D.

A82-35067 # A concept for light-powered flight. L. N. Myrabo (BDM Corp., McLean, VA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1214.* 20 p. 22 refs.

The concept for an advanced flight transport vehicle propelled by variable cycle laser propulsion engines is described. The vehicle is designed for efficient propulsion both within the atmosphere (by momentum exchange) and in space (as a rocket). Pulsed laser power is absorbed directly into gaseous reaction propellants by electrical gas breakdown and inverse Bremsstrahlung. Small scale experiments on each key engine component have been performed, and their performance characteristics are known. Innovation results from the synergism of the various engine parts. The resultant system can demonstrate substantial performance improvements over conventional chemical thrusters and flight vehicle configurations - in a future era of plentiful beamed space power. (Author)

A82-35076 # Aircraft fire safety research with antimisting fuels - Status report. E. P. Klueg, B. C. Fenton, and S. L. Imbrogno (FAA, Technical Center, Atlantic City, NJ). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1235.* 26 p. 18 refs.

Laboratory tests have been developed which characterize the antimisting, filtration, and flammability properties and the degradation level of antimisting kerosene (AMK). Interrelations among rheological, physical, and flammability properties and production and compatibility characteristics of antimisting additives are discussed. Problems caused by addition of water to AMK are studied, as are the tendency of AMK to form gel under conditions of cold temperature and shear. AMK is found to provide very significant fire protection benefits under impact survivable crash conditions. Problems of in-line blending of antimisting additive FM-9 and of airframe fuel system hardware incompatibilities are surmountable. Turbine engines can operate on FM-9 and meet performance criteria provided the fuel is highly degraded, which does not present insurmountable problems. C.D.

A82-35077 # Will hydrogen-fueled aircraft be safe. G. D. Brewer (Lockheed-California Co., Burbank, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1236.* 6 p. 9 refs.

Analysis has shown that liquid hydrogen will be significantly safer than liquid methane and synjet, the other alternative fuels for aircraft. With LH2 there will be less risk of a major spill occurring in event of a crash in which passengers can survive the impact. If fuel is spilled, and assuming ignition does not occur, LH2 will not spread as far before it vaporizes, becomes buoyant, and dissipates in the atmosphere. If the spilled fuel is ignited, as will occur more than 80 percent of the time with any of the fuels, the resulting hydrogen fire will be of such short duration and will be confined to such a small area that the passenger survival rate can be expected to be much higher. (Author)

A82-35078 # Icing conditions on sea level gas turbine engine test stands. H. J. Willcocks (United Technologies Corp., Government Products Div., West Palm Beach, FL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1237.* 7 p. 7 refs.

Engine icing conditions are discussed and various methods of icing prevention are compared. Icing can be caused by a drop in the static temperature within the engine inlet duct or by increase of relative humidity with increasing Mach number till saturation. Two types of icing exist, engine face icing and general stand icing, which includes engine face icing. Stand inlet heaters are found to provide the best solution to engine face and general stand icing, but are not cost-effective to use for icing alone. Engine running appears useful for engine face icing but is hazardous when general stand icing is present. An ice detector rig is described which will discriminate between the two types of icing, and so permit running the engine when appropriate. C.D.

A82-35079 # Model test and full scale checkout of dry-cooled jet runup sound suppressors. J. L. Grunnet (FluiDyne Engineering Corp., Minneapolis, MN) and E. Ference (U.S. Navy, Naval Facilities Engineering Command, Alexandria, VA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1239.* 12 p. 7 refs.

This paper describes the design, model testing and full-scale checkout of hush house type jet aircraft runup sound suppressors. This hush house concept features: complete enclosure of the aircraft, dry cooling of the exhaust sound suppressor even during afterburning, and adaptability of one enclosure to a variety of aircraft types. The comparison of model test data and full-scale checkout data (exhaust system temperatures, air flow rates and exhaust sound suppression) is emphasized in the paper. Also the extension of the concept to unusual aircraft designs and to dry-cooled engine test cells are covered. (Author)

A82-35080 * # Increased capabilities of the Langley Mach 7 Scramjet Test Facility. S. R. Thomas and R. W. Guy (NASA, Langley Research Center, Hampton, VA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1240.* 13 p. 15 refs.

An experimental research program which explored the potential for expanding the operating range of NASA Langley's Mach 7 Scramjet Test Facility is described. The facility uses electric arc-heated air as the test gas and is configured for testing airframe-integrated scramjet engine models at conditions duplicating flight velocities and temperatures. Previous scramjet testing in this facility was limited to a single simulated flight condition of Mach 6.9 at 115,300 ft. altitude.

The present arc heater research demonstrated that the facility can be used for scramjet testing at simulated flight conditions from Mach 4 (at altitudes from 77,000 to 114,000 ft.) to Mach 7 (at altitudes from 108,000 to 149,000 ft.). Flow quality was established from the uniformity of measured total temperature profiles. In addition, nitrogen oxide levels in the test stream were determined for relating engine test data to expected flight performance. The test frequency and reliability of the facility were also improved by a novel redesign of the heater downstream electrode and by defining limits for stable arc operation. (Author)

A82-35089 # **Characteristics of a side dump gas generator ramjet.** P. R. Choudhury (Southern California, University, Los Angeles, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1258.* 5 p. 7 refs. Grant No. AF-AFOSR-77-3354.

This paper deals with an experimental study of a small side dump gas generator ramjet whose geometric characteristics and flow field were changed parametrically to investigate the interaction of vortices and stable burning in the combustor. Vortices were perturbed and the size of the recirculation zone reduced by external means. The results show that the vortices at the head are crucial to stable and oscillation free operation. Axial fuel injection at the head and the introduction of swirl by canting the inlets tend to weaken the system of vortices at the head and thereby degrade the burner performance. Secondary vortices downstream of the dump plane are weak and cannot function properly without the recirculation zone at the head acting as a 'pilot flame'. A well designed side dump burner can operate satisfactorily at low IR and visible signatures in the exhaust. Although the burner was not choked at the exit plane, it is felt that the mutual interaction of vortices would not change significantly for the choked case and the conclusions from this study would aid in designing a real side dump propulsion system. (Author)

A82-35091 * # **A comprehensive method for preliminary design optimization of axial gas turbine stages.** R. M. Jenkins (Tuskegee Institute, Tuskegee, AL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1264.* 11 p. 15 refs. Grant No. NsG-3295.

A method is presented that performs a rapid, reasonably accurate preliminary pitchline optimization of axial gas turbine annular flowpath geometry, as well as an initial estimate of blade profile shapes, given only a minimum of thermodynamic cycle requirements. No geometric parameters need be specified. The following preliminary design data are determined: (1) the optimum flowpath geometry, within mechanical stress limits; (2) initial estimates of cascade blade shapes; (3) predictions of expected turbine performance. The method uses an inverse calculation technique whereby blade profiles are generated by designing channels to yield a specified velocity distribution on the two walls. Velocity distributions are then used to calculate the cascade loss parameters. Calculated blade shapes are used primarily to determine whether the assumed velocity loadings are physically realistic. Model verification is accomplished by comparison of predicted turbine geometry and performance with four existing single stage turbines. C.D.

A82-35100 # **Individual bypass throttling in fighter engines.** H. Kuenkler (Industrieanlagen-Betriebsgesellschaft mbH, Ottobrunn, West Germany). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1265.* 9 p.

It is demonstrated that individual bypass throttling (IBT) by an independent bypass nozzle/throttle device is an attractive means of influencing partload specific fuel consumption characteristics in low bypass ratio turbofan engines, such as those of fighter aircraft, without introducing turbocomponent variable-geometry features. An IBT application is considered in which total engine pressure ratio as well as bypass ratio have been selected with a view to high thrust characteristics and optimum reheat conditions, while the low-partload specific fuel consumption was decreased by means of the IBT feature. The calculated total propulsive weight for both long-loiter and interception fighter missions shows that the more complex construction of a separate bypass nozzle will be compensated by the new engine design's efficiency. An 8% takeoff weight saving was attained by the IBT engine over a conventional design for the two missions considered. O.C.

A82-35101 # **Combat survivability in the Advanced Technology Engine Study /ATES/.** L. Throndson (U.S. Naval Weapons Center, China Lake, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1287.* 9 p.

The Advanced Technology Engine Study (ATES) has shown that the advanced tactical aircraft used as study baselines will have high survivability in year-2000 combat scenarios which include advanced missile threats in high densities. Reductions in radar cross section and infrared signature greater than 50%, however, are required for significant reductions in combat attrition losses. Cost studies indicate that configurations requiring extensive modification for low observables should be avoided, in favor of 15-year peacetime life cycle cost vehicles possessing low radar and infrared detectability features from the outset of design formulation. Attention is given to engine cycle, bypass configuration and nozzle design elements of infrared signature reduction, as well as requirements for radar cross section reduction in engine inlet and nozzle design. O.C.

A82-35102 # **Turbine stage heat flux measurements.** M. G. Dunn (Calspan Advanced Technology Center, Buffalo, NY) and J. L. Holt (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1289.* 8 p. 30 refs. Contract No. F33615-81-C-2017.

This paper describes an ongoing effort at Calspan designed to obtain detailed heat transfer data for a full-stage rotating turbine. A description of the accompanying analysis effort intended to define the range of validity of the various predictive methods is also presented. The experiments are performed using a shock tunnel as a short-duration source of heated air which is used to drive a test-section device containing the high-pressure stage of the Garrett TFE 731-2 turbine. The turbine is extensively instrumented with thin-film heat-transfer gauges. Heat-flux distributions have been obtained at the turbine design flow function and 100% corrected speed for values of the ratio of the wall temperature to the total temperature in the range of 0.2 to 0.3. (Author)

A82-35233 **Ultralight airplanes.** M. A. Markowski. *Scientific American,* vol. 247, July 1982, p. 62-68.

The typical design features and performance capabilities of ultralight aircraft, which incorporate a small reciprocating engine on a hang glider airframe and may be flown without a pilot's license, are described. Designs of this class, of which more than 10,000 were sold in 1981, generally have an empty weight of 200 lbs, a wingspan of more than 30 ft, and cruising and stalling speeds of 50 and 25 mph, respectively. Glide ratios better than 9:1 and 500 ft/min rates of climb have been achieved. After a brief historical account of ultralight-like aircraft development, attention is given to the aerodynamic and propulsion-system features of a variety of popular configurations. It is noted that great care must be taken by ultralight pilots of wind conditions, because of their crafts' high sensitivity to gusts. Extant ultralight configurations are illustrated with attention to performance-maximizing features. O.C.

A82-35256 **A laboratory mock-up ultrasonic inspection system for composites.** F. H. Chang (General Dynamics Materials Research Laboratory, Fort Worth, TX), J. R. Bell, A. H. Gardner, C. P. Fisher, and R. W. Haile. *Materials Evaluation,* vol. 40, June 1982, p. 756-761. Contract No. F33615-77-C-5206.

The use of advanced composite materials in aircraft structures offers distinct advantages in terms of reduced weight, increased performance, lower cost, and higher structural reliability. The complexity of the advanced composite structures increases the degree of difficulty for nondestructive testing (NDT) and inspection. The major NDT techniques for composite structure inspection are ultrasonics and radiography. In connection with requirements for the low-cost inspection of large areas for small flaws, a need exists for an in-service inspection system for composites which will record the flaw location in a pseudo real-time C-scan while minimizing the operator effort to attain a high level of inspection reliability. In 1978 a program was initiated with the aim to develop such an in-service inspection system (ISIS) for advanced composite aircraft structure. A description is given of a laboratory mock-up model of the ISIS. G.R.

A82-35257 **Acoustic emission in jet engine fan blades.** E. v. K. Hill (Clemson University, Clemson, SC) and D. M. Egle (Oklahoma, University, Norman, OK). *(American Society for Nondestructive Testing, Fall Conference, Atlanta, GA, Oct. 1981.) Materials Evaluation,* vol. 40, June 1982, p. 770-773. 10 refs. Contract No. F34601-78-C-2826.

Titanium alloys, in connection with their low density and, in general, good mechanical properties at high temperatures, are particularly popular for applications in high performance military aircraft. However, unfortunately these materials exhibit also low fracture toughness which can often lead to sudden failure of components without warning. An enhancement of nondestructive test procedures to reduce damage related to the failure of compressors in turbofan engines proved to be only partly successful. A test program was, therefore, developed for the study of flaw growth in fan blades using acoustic emission (AE). It was found through testing that AE can detect the presence of flaws even when conventional techniques cannot. Moreover, it can sense them long before they become critical. Therefore, it is believed that with a proper development program, acoustic emission could be the best nondestructive test technique for sensing flaws in jet engine fan blades. G.R.

A82-35278 # **F-14 inlet development experience.** R. H. Tindell, C. A. Hoelzer (Grumman Aerospace Corp., Bethpage, NY), and D. Alexander (U.S. Naval Air Systems Command, Washington, DC). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-5.* 11 p. Members, $2.00; nonmembers, $4.00.

The inlet control system of the F-14 fighter, which has demonstrated in-flight compatibility with the advanced F401-PW-400 and GE-F-101X engines, as well as the TF30 engine, is based on a simple concept that minimizes maintenance

AV-8B, and the F-4 to test the range of the combined method are indicated. M.S.K.

A82-35565 # A series of airfoils designed by transonic drag minimization for Gates Learjet aircraft. M. L. Hinson (Gates Learjet Corp., Wichita, KS) In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 489-509. 13 refs.

Airfoils designed for reduced transonic drag using various versions of numerical optimization programs are described and compared with experimental results. Focussing on evolutionary models of the Gates Learjet, efforts to find an airfoil to replace the currently used NACA 64A109 profile are explored. Noting a preference for flight around Mach 0.81 and the long range cruise design point of Mach 0.7, efforts were made to maintain low stall speeds, eliminate aileron buzz, minimize the structural components which needed changing, and fit the new wing within existing contours. The CONMIN constrained function minimization program was employed to find a minimum value of an objective function and simultaneously satisfy a set of constraints such as drag coefficient. FLO-6 was employed for aerodynamic parameters. One- and two-point optimization results are given for airfoils chosen and wind tunnel tests. Five airfoils with reduced drag were constructed. M.S.K.

A82-35566 # Applied computational transonics - Capabilities and limitations. P. A. Henne, J. A. Dahlin, and C. C. Peavey (Douglas Aircraft Co., Long Beach, CA) In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 511-543. 19 refs.

Computational transonic methods which feature nonconservative solution of the full-potential equation for airfoils and wings are examined from the viewpoint of utilization in a production framework. Attention is given to direct solutions in defining the aerodynamic flow about a body and to inverse solutions obtained in the design process. The direct solutions comprise the Program H and FLO-22 codes and involve finite difference schemes to describe the potential flow. The concept of surface transpiration is the basis for the two- and three-dimensional inverse methods, those of Tranen and Henne, respectively. Direct solutions entail simulation of viscous effects through boundary layer additions to the airfoil surface, in addition to approximate fuselage volume and cross flow effects in the three-dimensional case. Inverse methods require the inclusion of the capability of airfoils to produce shocks. Comparisons are made between predicted and observed airfoil performance in transonic flows. M.S.K.

A82-35567 # Evaluation of full potential flow methods for the design and analysis of transport wings. L. R. Miranda (Lockheed-California Co., Burbank, CA) In: Transonic aerodynamics; Transonic Perspective Symposium, Moffett Field, CA, February 18-20, 1981, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 545-561.

The applicability and limitations present with the use of currently available full potential flow computer codes for the analysis of transport-type wings in the transonic regime are investigated. It is noted that the design process involves definition of the target pressure distributions for analytical generation of a tentative design which is then analyzed numerically through the available codes. The FLO-22 scheme employs a nonconservative difference scheme with a computational grid generated by a series of sheared and parabolic coordinate transformations. The FLO-28 and -30 codes are based on the finite volume conservative difference scheme. Use of the three schemes for the design of a wing and subsequent verification in the NASA-Ames Transonic Tunnel is described. Inclusion of viscous effects was found to enhance the accuracy of the modeling process. M.S.K.

A82-35727 Triggered lightning. D. W. Clifford (McDonnell Aircraft Co., St. Louis, MO) and H. W. Kasemir (Colorado Scientific Research Corp., Berthoud, CO). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 112-122. 41 refs.

The present investigation is concerned with the possible triggering of lightning as a result of introducing an aircraft or other aerospace vehicle into the atmospheric electrical system, taking into account the study of natural lightning processes reported by Uman and Krider (1981). The evidence and arguments for aircraft-triggered lightning are reviewed, drawing upon the ground-based triggering experience for insights into the triggering process. The triggering arguments which have been advanced are examined and compared with in-flight lightning-strike reports to deduce the flight and weather conditions most likely to produce triggered lightning. Based upon the conclusions drawn about the triggering process, the probable characteristics of aircraft-triggered lightning are discussed in light of their effects on aircraft safety. G.R.

A82-35729 Airborne warning systems for natural and aircraft-initiated lightning. L. W. Parker (Lee W. Parker, Inc., Concord, MA) and H. W. Kasemir (Colorado Scientific Research Corp., Berthoud, CO). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 137-156. 83 refs. Contract No. F19628-79-C-0161.

A needs exists for reliable and inexpensive (light-weight) airborne lightning warning and avoidance systems. In one application of such a system warnings would be provided of distant storms, enabling a pilot to avoid severe weather. In another application warnings of possible imminent lightning strikes would be given to the aircraft in electrified clouds. Two general classes of lightning warning systems are considered, including systems providing distant warnings and systems giving near-zone warnings. Dectors providing near-range warnings are discussed. These are electrostatic-field detectors which can be useful for warning and avoidance of lightning strikes to the aircraft. They warn of the presence of high electric fields. A description is also given of detectors providing distant warnings. Attention is given to RF sferics bearing detection (direction-finding) by magnetic loops, HF-VHF-UHF bearing detectors, optical bearing detectors, RF-sferics range detection, and bearing errors. G.R.

A82-35730 The direct effects of lightning on aircraft. J. A. Plumer (Lightning Technologies, Inc., Pittsfield, MA) and J. D. Robb (Lightning and Transients Research Institute, St. Paul, MN). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 158-172. 24 refs.

In the case of early wooden aircraft, lightning could produce catastrophic results. However, the conventional aluminum airframes of the aircraft replacing the early aircraft types have, by virture of their excellent electrical conductivity, rarely suffered critical damage from lightning strikes. But now the situation is changing again with the advent of aircraft constructed partly (and sometimes entirely) of new, fiber-reinforced plastics with desirable lightweight and high-strength properties, but with poor electrical conductivity. The designers of nonmetallic structures must, therefore, give particular attention to the lightning environment, taking positive measures to protect against its adverse effects lest safety of flight be endangered. A review is conducted of the physical-damage effects, called direct effects, of lightning on aircraft structures and fuel systems, taking into account the implementation of basic protective methods. Attention is given to metallic structures, nonmetallic structures, and fuel systems. G.R.

A82-35731 Electromagnetic interaction of lightning with aircraft. R. A. Perala, T. Rudolph, and F. Eriksen (Electro-Magnetic Applications, Inc., Denver, CO). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 173-203. 127 refs.

The electromagnetic interaction of lightning with aircraft is a complex event. Because of new aircraft technologies, it is becoming more important to be able to predict and understand lightning-induced transients on avionics systems. In this paper, a review of state-of-the-art of lightning-interaction modeling is presented. The overall interaction process is discussed, and specific modeling techniques are given for external interaction, internal interaction, and internal propagation. Some examples are given for lightning strokes attached to an aircraft. A discussion of nonlinear effects is also given, and comparison between nuclear electromagnetic pulse and lightning environments are presented. Finally, an overview of hardening techniques is given. An extensive bibliography is included. (Author)

A82-35732 Static charging and its effects on avionic systems. J. E. Nanevicz (SRI International Electromagnetic Sciences Laboratory, Menlo Park, CA). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 203-209. 15 refs.

It is pointed out that the effects of electrostatic charging first became apparent when aircraft began operation under all-weather conditions. Frictional charging of the aircraft occurred when precipitation particles struck the aircraft and deposited a charge on its surface. The charging, in turn, led to electrical discharges from the aircraft, which generated noise which interfered with the communication and navigation equipment. Techniques were developed to mitigate the undesirable effects of charging and discharging processes. Investigations related to the occurrence of static electrification are discussed, and a description is provided of interference sources and their effects on systems. Attention is given to corona discharges, streamer discharges, discharges from helicopter blades, and spark discharges. G.R.

A82-35733 Lightning simulation and testing. D. W. Clifford, E. H. Schulte (McDonnell Aircraft Co., St. Louis, MO), and K. E. Crouch (Lightning Technologies, Inc., Pittsfield, MA). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 209-224. 34 refs.

Laboratory simulation testing is relied upon for assessing the effects of lightning on aircraft and other aerospace systems. This paper reviews the laboratory equipment, techniques, and test waveforms used in simulating the important effects of atmospheric electricity on aerospace systems. Test criteria and techniques are well established for simulating the direct physical damage effects of lightning, but tests for determining the indirect, induced-coupling effects of lightning are still in the development stage. These last tests are necessary for evaluating the effects of the lightning environment on modern aircraft which make extensive use of computerized flight-control systems. (Author)

A82-35734 **Assessment of aircraft susceptibility/vulnerability to lightning and development of lightning-protection design criteria.** J. C. Corbin (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH) and W. W. Cooley (Boeing Military Airplane Co., Seattle, WA). *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-24, May 1982, pt. 1, p. 225-237. 21 refs.

Possible approaches for assessing the susceptibility/vulnerability of aircraft to both the direct and indirect (induced) effects of lightning and for developing lightning-protection design criteria are examined. Particular emphasis is focused on methods that can be used to achieve a high level of confidence in aircraft safety and survival. Assessment factors and their uncertainties are qualitatively and quantitatively discussed. Lightning-protection design approaches involving both test and analysis as applied to the F-16 fighter aircraft and the NASA Space Shuttle are reviewed. A probabilistic or statistical approach is outlined (with examples) for predicting single and/or redundant equipment failure due to indirect lightning effects. (Author)

A82-35767 # **Laser application in weapon guidance and active imaging.** V. V. Rampal (Instruments Research and Development Establishment, Dehra Dun, India). *Indian Journal of Physics, Section B*, vol. 54B, no. 4-5, Aug.-Oct. 1980, p. 465-470. 10 refs.

The application of lasers in weapon guidance and active imaging is reviewed. Modern low flying aircraft used for ground attack are fitted with suitable laser instrumentation to provide range finding and target capabilities for seeking the target, and to measure its range, sending the weapon into it and thus reducing human element to the minimum. The principle of laser guidance is discussed, and the cost effectiveness of the weapon system is considered. Laser imaging using a high average power Nd YAG laser is described, and evidence for the possibility of using high repetition rate pulsed lasers for illumination and imaging of distant targets at night is presented. D.L.G.

A82-35820 # **Aerodynamic lag functions, divergence, and the British flutter method.** W. P. Rodden and E. D. Bellinger (MacNeal-Schwendler Corp., Los Angeles, CA). *Journal of Aircraft*, vol. 19, July 1982, p. 596-598. 18 refs.

Results of calculations of flutter and divergence instabilities for a two-dimensional airfoil are presented in a comparison of the transient method, which includes the transient aerodynamic representation explicitly, and the British flutter method, which only includes transient aerodynamics implicitly. The calculations involve airfoils mounted on bending and torsion springs, with the center of gravity located at 37% or 45% chord, aerodynamic center at 25% chord, and elastic axis at 40% chord. Both the transient and the British flutter method using either the exact Theodorsen function or the Jones approximation to the Theodorsen function show that flutter occurs when the torsion root becomes unstable, whereas divergence occurs when an aerodynamic lag root becomes unstable. It is concluded that the British flutter method adequately predicts all of the instabilities of aeroelastic systems without any need for approximations to aerodynamic transfer functions. S.C.S.

A82-35821 # **STOL aircraft response to turbulence generated by a tall upwind building.** L. D. Reid (Toronto, University, Toronto, Canada). *Journal of Aircraft*, vol. 19, July 1982, p. 601-603. 8 refs. Research supported by Environment Canada and Natural Sciences and Engineering Research Council of Canada.

The influence of building-induced turbulence on the landing approach of an STOL aircraft is predicted by the use of the turbulence correlation technique. Measurements of turbulence intensity and the turbulence correlation matrix were made in a planetary boundary layer wind tunnel with a simulated 152.4-m tall building and a steep (15-deg) glideslope located in the wind field. Calculations based on the measured turbulence correlation matrix for the case of a twin-engine turboprop light STOL transport executing a constant airspeed landing approach with fixed controls in the presence of a constant headwind indicate the presence of the building to result in a general increase in the dispersion of the longitudinal state vector of the aircraft, with the extent of increase becoming greater towards the bottom of the glideslope as the aircraft nears the building. It is noted, however, that the upwind building has only a minor impact on the turbulence-induced disturbance to the landing approach. S.C.S.

A82-35869 **Multiple aircraft tracking system for coordinated research missions.** P. N. Johnson and J. L. Fink (National Center for Atmospheric Research, Boulder, CO). *American Meteorological Society, Bulletin*, vol. 63, May 1982, p. 487-491.

The Multiple Aircraft Position System was developed in response to the need for aircraft position in the coordination of large field projects involving several research aircraft. Radio interferometer techniques are used to provide rapid, accurate determination of positions for up to 10 aircraft furnished with special airborne radio beacons. Three remote interferometer array sites receive the signals from the airborne beacons, each transmitting at a unique frequency. Each remote site is tuned to one beacon frequency at a time according to a programmable polling sequence; several phase difference measurements are made from the received signal. These data then are telemetered to a central control station where they are transferred to a computer that calculates the direction cosines from each remote site to the airborne beacon, and thus determines the position of the beacon. The aircraft positions then are immediately available for display. (Author)

A82-35874 † **The effect of erosion wear on the vibration characteristics of axial-turbine blades (Vliianie erozionnogo iznosa na vibratsionnye kharakteristiki lopatok osevykh turbomashin).** R. G. Perel'man, V. V. Bodryshev, V. V. Priokhin, E. B. Karpin, L. V. Matrosova, and V. N. Chebotarev (Moskovskii Aviatsionnyi Institut, Moscow; Ob'edinenie Kaluzhskii Turbinnyi Zavod, Kaluga, USSR). *Energetika*, Apr. 1982, p. 60-64. 5 refs. In Russian.

A variational method based on the theory of twisted rods with nonrectilinear axis is used to analyze the effect of erosion wear on the vibration characteristics of axial-turbine blades. It is shown that relative variations of vibration frequencies of free blades for static and dynamic modes of operation almost coincide. Theoretical results agree well with experimental data. B.J.

A82-35876 **Certification of an airborne Loran-C navigation system.** F. D. MacKenzie (U.S. Department of Transportation, Transportation Systems Center, Cambridge, MA). *Navigation*, vol. 29, Spring 1982, p. 69-79. 5 refs. Research supported by the Research and Special Programs Administration.

The requirements, FAA approval process, testing, and analysis which led to acceptance of a Loran-C navigational system certification for the state of Vermont are detailed. NASA personnel from Langley Research Center designed, fabricated, installed, and calibrated the on-board data collection instrumentation, as well as the software for analysis of the airborne and ground-based records. Flights were required during visual and instrument conditions, day and night, through all seasons, and during twilight conditions, while the Loran-C signal characteristics were measured at ground stations for EM compatibility, predictability, temporal stability, and ease of airborne acquisition. Standard deviations were either calculated or measured for the equipment, for parts of the system, and for the pilot's contribution to the errors. The Loran-C system was determined to meet or exceed all relevant criteria. M.S.K.

A82-35881 **Propellers come full circle.** R. DeMeis. *High Technology*, vol. 2, July-Aug. 1982, p. 16-18.

The use of the propfan in future aircraft is discussed. With the large external fan generating more thrust per engine revolution than a small internal fan, propfan jets could achieve fuel savings as high as 25 percent in commercial operations and 35 percent for military patrol missions, while retaining the vibration-free operation and mechanical simplicity of turbojet engine cores. The propfan would have as many as 12 stiff composite blades that would be highly swept, thinner, and shorter than conventional blades in order to reduce noise and drag. The gearbox would be reintroduced to permit operation at maximum efficiency with the best blade rotation speed for the airflow conditions. A double-wall insulated fuselage and shaped wing-nacelle interface would deal with internal aircraft noise and propfan-swept wing integration problems. The development of the propfan may depend on continued government funding to NASA's program. C.D.

A82-36047 # **Prospects for Navsat - A future worldwide civil navigation-satellite system.** C. Rosetti (ESA, Directorate of Applications Programmes, Paris, France). *ESA Bulletin*, no. 30, May 1982, p. 54-59.

Air navigational problems which inhibit flying optimal routes and which could be aided by a worldwide navigational satellite system (Navsat) are examined. Satellite systems are noted to alleviate ground- and air-based equipment constraints for the airlines, developing nations in need of mapping assistance, offshore oil drilling operations, and geodetic surveys. A Navsat system, following the design adopted by military GPS operations, involves a receiver capable of detecting time-lapsed signals from well-positioned satellites. The transmission is broadcast in terms of a lock-on signal and a signal carrying tens of bits/sec of information regarding ephemerides. Either mobile or fixed receivers can gain precise location data by tuning in to two or three satellites simultaneously. A potential system involving 24 satellites is described, which would offer 95.6% availability from anywhere on earth. M.S.K.

A82-36054 **Aircraft measurements of icing in supercooled and water droplet/ice crystal clouds.** M. Bain and J. F. Gayet (Clermont-Ferrand II, Université, Aubière, Puy-de-Dôme, France). *Journal of Applied Meteorology*, vol. 21, May 1982, p. 631-641. 19 refs. Direction des Recherches, Etudes et Techniques *Contract No. 79-34-183.*

Some results of icing rate measurements connected with meteorological parameters during penetrations into stratiform and cumuliform clouds are described. Icing measurements were carried out in Spain during a precipitation enhancement project experiment in 1979, using an instrumented DC-7 aircraft. The meteorological parameters determined include the temperature, concentration of large ice particles, liquid water content, cloud droplet concentration, and median volume diameter. The energy balance at the riming surface of a cylinder is analyzed and the critical liquid water concentration determined in order to predict the ice growth regime (wet or dry), with an 85 percent success rate. An for addition of area navigation capability are reported. The receiver is an envelope processor, offering simplicity of RF processor circuitry. Author

N82-26209*# Ohio Univ., Athens. Avionics Engineering Center.
COMMUTATED AUTOMATIC GAIN CONTROL SYSTEM

Stephen R. Yost *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 139-155 refs
Avail: NTIS HC A11/MF A01 CSCL 17G

The commutated automatic gain control (AGC) system was designed and built for the prototype Loran-C receiver is discussed. The current version of the prototype receiver, the Mini L-80, was tested initially in 1980. The receiver uses a super jolt microcomputer to control a memory aided phase loop (MAPLL). The microcomputer also controls the input/output, latitude/longitude conversion, and the recently added AGC system. The AGC control adjusts the level of each station signal, such that the early portion of each envelope rise is about at the same amplitude in the receiver envelope detector. Author

N82-26210*# Ohio Univ., Athens. Avionics Engineering Center.
A PROTOTYPE INTERFACE UNIT FOR MICROPROCESSOR-BASED LORAN-C RECEIVER
Stanley M. Novacki, III *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 157-164 refs

Avail: NTIS HC A11/MF A01 CSCL 17G

A data/command entry ASCII keypad with a CRT display capable of alphanumeric and graphics mode operation which provides specialized data entry and graphics mode operation which receiver/processor was developed. This unit will replace conventional communication terminal to simplify receiver operations to a level typical of current avionics systems. E.A.K.

N82-26212*# Princeton Univ., N. J. Dept. of Mechanical and Aerospace Engineering.
INVESTIGATION OF AIR TRANSPORTATION TECHNOLOGY AT PRINCETON UNIVERSITY, 1981
Robert F. Stengel *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 181-187 refs
Avail: NTIS HC A11/MF A01 CSCL 01C

A summary of the air transportation technology program is presented. The following topics were examined: (1) fuel use characteristics of general aviation aircraft; (2) dead-reckoning concept incorporating a fluidic rate sensor; (3) experimentation with an ultrasonic altimeter; (4) development of laser-based collision avoidance systems; (5) flight path reconstruction from sequential DME data; (6) application of fiber optics in flight control systems; and (7) voice recognition inputs for navigation/communication receiver tuning. E.A.K.

N82-26213*# Princeton Univ., N. J.
FLYING QUALITIES CRITERIA FOR GA SINGLE PILOT IFR OPERATIONS
Aharon Bar-Gill *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 189-210
Avail: NTIS HC A11/MF A01 CSCL 17G

The flying qualities criteria in general aviation (GA) to decrease accidents are discussed. The following in-flight research is discussed: (1) identification of key aerodynamic configurations; (2) implementation of an in-flight simulator; (3) mission matrix design; (4) experimental systems; (5) data reduction; (6) optimal flight path reconstruction. Some of the accomplished work is reported: an integrated flight testing and flight path reconstruction methodology was developd, high accuracy in trajectory estimation was achieved with an experimental setup, and a part of the flight test series was flown. E.A.K.

N82-26214*# Princeton Univ., N. J.
AIR DATA MEASUREMENT USING DISTRIBUTED PROCESSING AND FIBER OPTICS DATA TRANSMISSION
Kristin A. Farry *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 211-217
Avail: NTIS HC A11/MF A01 CSCL 01D

Distributed processing, fiber optics technology, and redundancy management in the aircraft environment are discussed. The project features the development of an angle-of-attack and sideslip data collection system hich features: (1) two independent microprocessor controlled data collection and calibration units; (2) transmission of data to the control system on a fiber optic data bus; and (3) software implemented error detection and recovery. E.A.K.

N82-26215*# Princeton Univ., N. J.
INPUT/OUTPUT MODELS FOR GENERAL AVIATION PISTON-PROP AIRCRAFT FUEL ECONOMY
L. M. Sweet *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 219-227

Avail: NTIS HC A11/MF A01 CSCL 01C

A fuel efficient cruise performance model for general aviation piston engine airplane was tested. The following equations were made: (1) for the standard atmosphere; (2) airframe-propeller-atmosphere cruise performance; and (3) naturally aspirated engine cruise performance. Adjustments are made to the compact cruise performance model as follows: corrected quantities, corrected performance plots, algebraic equations, maximize R with or without constraints, and appears suitable for airborne microprocessor implementation. The following hardwares are recommended: ignition timing regulator, fuel-air mass ration controller, microprocessor, sensors and displays. E.A.K.

N82-26216*# Princeton Univ., N. J.
WIDE FIELD OF VIEW LASER BEACON SYSTEM FOR THREE DIMENSIONAL AIRCRAFT RANGE MEASUREMENTS
E. Y. Wong *In* NASA. Langley Research Center Joint Univ. Program for Air Transportation Res., 1981 Jun. 1982 p 229-236

Avail: NTIS HC A11/MF A01 CSCL 20E

A system that measures accurately the distance from an aircraft to a helicopor for rotor noise flight testing was developed. The system measures the range and angles between two aircraft using laser optics. This system can be applied in collision avoidance, robotics and other measurement critical tasks. E.A.K.

N82-26217*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF WING-LEADING-EDGE MODIFICATIONS ON A FULL-SCALE, LOW-WING GENERAL AVIATION AIRPLANE: WIND-TUNNEL INVESTIGATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC CHARACTERISTICS
William A. Newsom, Jr., Dale R. Satran, and Joseph L. Johnson, Jr. Jun. 1982 107 p refs
(NASA-TP-2011; L-15101; NAS 1.60:2011) Avail: NTIS HC A06/MF A01 CSCL 01A

Wing-leading-edge modifications included leading-edge droop and slat configurations having full-span, partial-span, or segmented arrangements. Other devices included wing-chord extensions, fences, and leading-edge stall strips. Good correlation was apparent between the results of wind-tunnel data and the results of flight tests, on the basis of autorotational stability criterion, for a wide range of wing-leading-edge modifications. T.M.

N82-26218*# Spectron Development Labs., Inc., Costa Mesa, Calif.
OPERATING MANUAL HOLOGRAPHIC INTERFEROMETRY SYSTEM FOR 2 X 2 FOOT TRANSONIC WIND TUNNEL Final Report
James E. Craig Nov. 1981 58 p
(Contract NAS2-10297)
(NASA-CR-166344; NAS 1.26:166344; SDL-81-52002) Avail: NTIS HC A04/MF A01 CSCL 01B

A holographic interferometer system was installed in a 2X2 foot transonic wind tunnel. The system incorporates a modern, 10 pps, Nd:YAG pulsed laser which provides reliable operation and is easy to align. The spatial filtering requirements of the unstable resonator beam are described as well as the integration of the system into the existing Schieren system. A two plate holographic interferometer is used to reconstruct flow field data. For static wind tunnel models the single exposure holograms are recorded in the usual manner; however, for dynamic models such as oscillating airfoils, synchronous laser hologram recording is used. S.L.

N82-26219*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SUMMARY AND RECENT RESULTS FROM THE NASA ADVANCED HIGH SPEED PROPELLER RESEARCH PROGRAM

Glenn A. Mitchell and Daniel C. Mikkelson 1982 35 p refs Presented at the 18th Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; sponsored by AIAA, SAE and ASME
(NASA-TM-82891; E-1269; NAS 1.15:82891) Avail: NTIS HC A03/MF A01 CSCL 01B

Advanced high-speed propellers offer large performance improvements for aircraft that cruise in the Mach 0.7 to 0.8 speed regime. The current status of the NASA research program on high-speed propeller aerodynamics, acoustics, and aeroelastics is described. Recent wind tunnel results for five 8- to 10-blade advanced models are compared with analytical predictions. Test results show that blade sweep was important in achieving net efficiencies near 80 percent at Mach 0.8 and reducing near-field cruise noise by dB. Lifting line and lifting surface aerodynamic analysis codes are under development and some initial lifting line results are compared with propeller force and probe data. Some initial laser velocimeter measurements of the flow field velocities of an 8-bladed 45 deg swept propeller are shown. Experimental aeroelastic results indicate that cascade effects and blade sweep strongly affect propeller aeroelastic characteristics. Comparisons of propeller near-field noise data with linear acoustic theory indicate that the theory adequate predicts near-field noise for subsonic tip speeds but overpredicts the noise for supersonic tip speeds. Potential large gains in propeller efficiency of 7 to 11 percent at Mach 0.8 may be possible with advanced counter-rotation propellers. B.W.

N82-26220*# Goodyear Aerospace Corp., Akron, Ohio.

PRELIMINARY STUDY OF GROUND HANDLING CHARACTERISTICS OF BUOYANT QUAD ROTOR (BQR) VEHICLES Final Report

Ronald G. E. Browning Jul. 1980 275 p refs
(Contract NAS2-10448)
(NASA-CR-166130; NAS 1.26:166130) Avail: NTIS HC A12/MF A01 CSCL 01B

A preliminary investigation of mooring concepts appropriate for heavy lift buoyant quad rotor (BQR) vehicles was performed. A review of the evolution of ground handling systems and procedures for all airship types is presented to ensure that appropriate consideration is given to past experiences. Two buoyant quad rotor designs are identified and described. An analysis of wind loads on a moored airship and the effects of these loads on vehicle design is provided. Four mooring concepts are assessed with respect to the airship design, wind loads and mooring site considerations. Basing requirements and applicability of expeditionary mooring at various operational scenarios are addressed. B.W.

N82-26221# Applied Science Associates, Inc., Valencia, Pa.

MAINTENANCE TRAINING SIMULATOR DESIGN AND ACQUISITION: ISD-DERIVED TRAINING EQUIPMENT DESIGN Interim Report

Rohn J. Hritz and George R. Purifoy, Jr. Brooks AFB, Tex. AFHRL Feb. 1982 80 p
(Contract F33615-78-C-0019; AF Proj. 2361)
(AD-A110871; AFHRL-TP-81-52) Avail: NTIS HC A05/MF A01 CSCL 05/9

A model for documenting training equipment designs derived from an Instructional System Development (ISD) analysis is presented. The model contains blanks to be completed by the ISD analyst(s). Instructions for applying the model are provided. A method for communicating a specific training equipment design to the Simulator System Program Office (SimSPO) after the ISD analysis has established a need for a maintenance trainer is provided. The model provides the ISD analysts an opportunity to specify such design information as (1) characteristics of the target population who will use the trainer, (2) a list of the training objectives to be achieved using the trainer, (3) a list of the tasks to be practiced and/or acquired on the trainer and a list of the malfunctions to be presented by the trainer for isolation and/or correction, (4) a scenario discussing how the trainer will be used to achieve the specified training objectives, (5) a list of the physical and functional characteristics of the components to be represented on the trainer, and (6) a description of the instructional features required on the trainer to facilitate training objective achievement. When utilized, the model will standardize the communication between ISD and SimSPO personnel. Author

N82-26222# Logistics Management Inst., Washington, D. C.

THE SORTIE-GENERATION MODEL SYSTEM. VOLUME 1: EXECUTIVE SUMMARY

John B. Abell Sep. 1981 25 p 6 Vol.
(Contract MDA903-80-C-0554)
(AD-A110897; LMI-DP101-Vol-1) Avail: NTIS HC A02/MF A01 CSCL 15/5

The Sortie-Generation Model System provides the capability for relating aircraft spares and maintenance manpower levels to the maximal sortie-generation capability of tactical air forces over time. Author (GRA)

N82-26223# Logistics Management Inst., Washington, D. C.

THE SORTIE-GENERATION MODEL SYSTEM. VOLUME 2: SORTIE-GENERATION MODEL USER'S GUIDE

John B. Abell, Robert S. Greenberg, and Michael J. Konvalinka Sep. 1981 129 p 6 Vol.
(Contract MDA903-80-C-0554)
(AD-A110898; LMI-DP101-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 15/5

This volume, the second of six volumes, provides sufficient information to allow a user to run the Sortie-Generation Model (SGM). Volume III, Sortie-Generation Model Analyst's Manual, describes the mathematical structures, derivations, assumptions, limitations, and data sources of the SGM at a very detailed level. Volume IV, Sortie-Generation Model Programmer's Manual, specifies the details of the computer programs, file structures, job control language, and operating environment of the SGM. Volume V describes the maintenance subsystem and explains the construction of the maintenance input file to the SGM. Volume VI describes the spares subsystem and shows a user how to build the spares file that is used by the SGM. GRA

N82-26224# Logistics Management Inst., Washington, D. C.

THE SORTIE-GENERATION MODEL SYSTEM. VOLUME 4: SORTIE-GENERATION MODEL PROGRAMMERS MANUAL

Michael J. Konvalinka and John B. Abell Sep. 1981 193 p refs 6 Vol.
(Contract MDA903-81-C-0166)
(AD-A110899; LMI-ML102-Vol-4) Avail: NTIS HC A09/MF A01 CSCL 15/5

Sortie-Generation Model (SGM) Programmer's Manual, specifies the details of the computer programs, file structures, job control language, and operating environment of the SGM. GRA

N82-26225# Logistics Management Inst., Washington, D. C.

THE SORTIE-GENERATION MODEL SYSTEM. VOLUME 5: MAINTENANCE SUBSYSTEM

Robert S. Greenberg Sep. 1981 513 p 6 Vol.
(Contract MDA903-81-C-0166)
(AD-A110815; LMI-ML102-Vol-5) Avail: NTIS HC A22/MF A01 CSCL 15/5

The Sortie-Generation Model System provides the capability for relating aircraft spares and maintenance manpower levels to the maximal Sortie-generation capability of tactical air forces over time. The maintenance subsystem estimates the maintenance manpower and performance input parameters for the queuing model that is embedded in the Sortie-Generation Model (SGM) System. This subsystem estimates the failure rate, service rate, and number of servers for each work center in a maintenance organization. Author (GRA)

N82-26226# Logistics Management Inst., Washington, D. C.

THE SORTIE-GENERATION MODEL SYSTEM. VOLUME 6: SPARES SUBSYSTEM

John B. Abell and F. Michael Slay Sep. 1981 180 p refs 6 Vol.
(Contract MDA903-81-C-0166)
(AD-A110900; LMI-ML102-Vol-6) Avail: NTIS HC A09/MF A01 CSCL 15/5

The Sortie-Generation Model System provides the capability for relating aircraft spares and maintenance manpower levels to the maximal sortie-generation capability of tactical air forces over time. This volume describes the process of constructing a spares data base for input to the Sortie-Generation Model. Author (GRA)

N82-26234*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LASER ANEMOMETER MEASUREMENTS IN AN ANNULAR

The Symposium provided a forum in which representatives from DOE, FAA, National Aeronautics and Space Administration (NASA) and the aviation industry exchanged information and ideas regarding current and future efforts to conserve fuel and to promote energy conservation within the commercial aviation sector. General topics discussed included Federal and industry energy conservation programs such as flight operations, air traffic control, engineering and maintenance, and corporate management strategies. The Symposium, was highlighted by a panel discussion entitled 'Energy Conservation: Where Do We Go From Here?' This report contains the papers and presentations from the Symposium. GRA

N82-26546# Lincoln Lab., Mass. Inst. of Tech., Lexington.
A COMPARATIVE STUDY OF NARROWBAND VOCODER ALGORITHMS IN AIR FORCE OPERATIONAL ENVIRONMENTS USING THE DIAGNOSTIC RHYME TEST
E. Singer 6 Jan. 1982 26 p refs
(Contract F19628-80-C-0002)
(AD-A112053; TR-590; ESD-TR-81-334) Avail: NTIS HC A03/MF A01 CSCL 17/2

This report presents a summary of work performed at Lincoln Laboratory aimed at improving the intelligibility of 2.4 kbps vocoders to be used in USAF operational environments. The distortions present in some of these environments, particularly the F-15 fighter aircraft, can place a severe burden on the speech modelling capabilities of contemporary vocoders. To study these effects and the benefits of various algorithmic improvements, the Diagnostic Rhyme Test was used as a means of providing an objective measure of relative system performance. A wide range of areas was explored through the use of real time computer simulations, including the effects of modified analysis and synthesis techniques, design parameter choices, interoperability, and environmental factors. The purpose of this report is to assemble and document the extensive body of DRT data which has been collected and thereby provide a means for the selection of design parameters likely to lead to improved vocoder performance. Author (GRA)

N82-26554# Ohio State Univ., Columbus. ElectroScience Lab.
ELEVATION PLANE ANALYSIS OF ON-AIRCRAFT ANTENNAS
Chong L. Yu and Walter Dennis Burnside Jan. 1982 93 p refs
(Contract N62269-71-C-0296)
(AD-A112373; ESL-3188-2) Avail: NTIS HC A05/MF A01 CSCL 09/5

The radiation patterns, in the elevation plane, of airborne antennas mounted on the aircraft fuselage have been analyzed by modern diffraction theory including wedge diffraction theory and creeping wave theory. It is found that the fuselage shape has a dominant effect on the elevation patterns. In order to analyze a general convex shape, a new approach, 'section matching method', has been developed in which the fuselage profile is described by a set of points. This new method is applied to some general geometrical shapes which approximate aircraft fuselage. The composite elliptical cylinder is the most general model considered. The validity of this method has been verified by modal one more rigorous GTD solutions. Author (GRA)

N82-26612# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Aerodynamics and Airframe Branch.
THE NUMERICAL SOLUTION OF THE NAVIER-STOKES EQUATIONS FOR INCOMPRESSIBLE TURBULENT FLOW OVER AIRFOILS Final Technical Report, Oct. 1979 - Feb. 1981
Harwood A. Hegna Oct. 1981 154 p refs
(AF Proj. 2307)
(AD-A111279; AFWAL-TR-81-3053) Avail: NTIS HC A08/MF A01 CSCL 20/4

Numerical solutions are obtained for two-dimensional incompressible turbulent viscous flow over airfoils of arbitrary geometry. An algebraic eddy viscosity turbulence model based on Prandtl's mixing length theory is modified for separated adverse pressure gradient flows. Finite difference methods for solving the inviscid stream function equation and the incompressible laminar Navier-Stokes equations are used. A finite difference method for solving the Reynolds averaged incompressible turbulent two-dimensional Navier-Stokes equations is employed. The inviscid stream function equation and the Navier-Stokes equations are transformed using a curvilinear transformation. A body-fitted coordinate system with a constant coordinate line defining the airfoil section surface is transformed to a rectangular coordinate system in the transformed or computational plane. An elliptic partial differential Poisson equation for each coordinate is used to generate the coordinate system in the physical plane for arbitrary airfoils. The two-dimensional time dependent Reynolds averaged incompressible Navier-Stokes equations in the primitive variables of velocity and pressure and a Poisson pressure equation are numerically solved. Turbulence is modelled with an adverse pressure gradient eddy viscosity technique. An implicit finite difference method is used to solve the set of transformed partial differential equations. The system of linearized simultaneous difference equations, at each time step, is solved using successive-over-relaxation iteration. GRA

N82-26619# Naval Surface Weapons Center, White Oak, Md.
COMPARISON OF NUMERICAL RESULTS AND MEASURED DATA FOR SMOOTH AND INDENTED NOSETIPS
Tsuying Hsieh 14 May 1981 12 p refs
(AD-A111794) Avail: NTIS HC A02/MF A01 CSCL 20/4

Numerical calculations, using an unsteady implicit numerical algorithm which solves either the inviscid or the thin-layer Navier-Stokes equations, were performed for smooth and severely indented nosetips at hypersonic speed and zero angle of attack. The computed results of inviscid and laminar flowfield are compared to wind tunnel measured data for surface pressure, shock location, heat transfer and density distribution in the shock layer. Good agreements between the calculated and measured flowfield are obtained for smooth nosetip without flow separation. Difficulties in the simulation of severely indented nosetips with large separation bubble or sharp corner are discussed.
Author (GRA)

N82-26660# Defense Mapping Agency, Washington, D.C. Advanced Technology Div.
THE HYDROGRAPHIC AIRBORNE LASER SOUNDER (HALS)
Stephen M. Webb 3 Feb. 1982 12 p refs
(AD-A111027) Avail: NTIS HC A02/MF A01 CSCL 08/10

To provide an increase in hydrographic survey resources the Hydrographic Airborne Laser Sounder is being developed by the Naval Ocean Research and Development Activity (NORDA) under the sponsorship of the Defense Mapping Agency (DMA). The HALS system incorporates a pulsed, scanning blue-green laser and will be flown in a helicopter from a survey ship operated by the U.S. Naval Oceanographic Office (NAVOCEANO). Through the use of statistics in post-flight processing the HALS data will meet survey accuracy standards, more than adequate for safe navigation. NORDA will perform a technical evaluation of HALS and then turn the system over to NAVOCEANO for operation in late 1983. Author (GRA)

N82-26701*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BIRD IMPACT ANALYSIS PACKAGE FOR TURBINE ENGINE FAN BLADES
Murray S. Hirschbein 1982 20 p refs Presented at 23rd Struct. Dyn. and Mater. Conf., New Orleans, 10-12 Previously announced in IAA as A82-30162 May 1982; Sponsored by AIAA, ASME, ASCE, and AHS
(NASA-TM-82831; NAS 1.15:82831) Avail: NTIS HC A02/MF A01 CSCL 20K

N82-26703*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPARISON OF ANALYTICAL AND WIND-TUNNEL RESULTS FOR FLUTTER AND GUST RESPONSE OF A TRANSPORT WING WITH ACTIVE CONTROLS
Irving Abel, Boyd Perry, III, and Jerry R. Newsom Jun. 1982 47 p refs
(NASA-TP-2010; L-15099; NAS 1.60:2010) Avail: NTIS HC A03/MF A01 CSCL 01C

Two flutter suppression control laws wre designed and tested on a low speed aeroelastic model of a DC-10 derivative wing. Both control laws demontrated increases in flutter speed in excess of 25 percent above the passive wing flutter speed. In addition, one of the control laws was effective in reducing loads due to turbulence generated in the wind tunnel. The effect of variations in gain and phase on the closed-loop performance was measured and is compared with predictions. In general, both flutter and gust response predictions agree reasonably well with experimental data. B.W.

N82-26720# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautical Engineering.
DESIGN OF A DATA ACQUISITION AND REDUCTION SYSTEM FOR FATIGUE TESTING M.S. Thesis
Jerry Wayne Dalton Sep. 1981 64 p refs
(AD-A110612) Avail: NTIS HC A04/MF A01 CSCL 14/2

A data acquisition and reduction system has been created for aircraft materials fatigue testing. The system uses an HP-9835 Desktop Calculator, an HP-2240A Measurement and Control Processor and a Materials Testing System loading machine. Three different computer programs on the HP-9835 are used to analyze material properties, simulate inflight fatigue loading and compute fatigue damage at a stress concentration. The flight loads are selected from Mil Spec 8866 and applied in a random order. The fatigue damage at a stress concentration is calculated from the applied local stresses using Miner's Law. Author (GRA)

N82-26822# Washington Univ. Technology Associates, Inc., St. Louis, Mo.
YAWING OF WIND TURBINES WITH BLADE CYCLIC-PITCH VARIATION Final Report, 15 Sep. 1979 - 15 Dec. 1980
K. H. Hohenemser, Andrew H. P. Swift, and David A. Peters Aug. 1981 242 p refs Prepared for Midwest Research Inst., Golden, Colo.
(Contracts DE-AC02-77CH-00178; EG-77-C-01-4042)
(DE81-029639; SERI/TR-8085-3-T2) Avail: NTIS HC A11/MF A01

The control system horizontal axis wind turbine is discussed. It incorporates two features: the application of blade cyclic pitch variation adopted from rotorcraft technology, and the use of yaw angle control, not only for wind direction following, but also for rotor speed or torque control. Cyclic pitch variation in a two-bladed rotor relieves the blades of all the gyroscopic and odd harmonic aerodynamic root moments. It makes rapid yaw rates of a two-bladed rotor possible without causing vibratory hub moments and without causing appreciable angular excursions of the blade tip path plane. Due to the allowable rapid yaw rates of wind turbines with blade cyclic pitch variation, the two conventional separate control systems - yaw control for wind direction following and blade feathering control for regulating rotor speed and torque - can be replaced by a system with only a single control variable, the rotor yaw angle. DOE

N82-26828# Sandia Labs., Albuquerque, N. Mex.
USER'S MANUAL FOR THE VERTICAL AXIS WING TURBINE CODE VDART2
J. H. Strickland, T. Smith, and K. Sun Sep. 1981 70 p refs
(Contract DE-AC04-76DP-00789)
(DE82-000796; SAND-81-7039) Avail: NTIS HC A04/MF A01

This user's manual provides details on the Darrieus wind turbine aerodynamic performance/loads prediction computer code, VDART2. The code is the latest generation of vortex-based models and includes the effects of dynamic stall, pitching circulation, and added mass. DOE

N82-26873# Air Force Engineering and Services Center, Tyndall AFB, Fla. Engineering and Services Lab.
THE BIOLOGICAL DEGRADATION OF SPILLED JET FUELS: A LITERATURE REVIEW Final Report, Jun. - Aug. 1981
Robert E. Carlson Oct. 1981 41 p refs
(AF Proj. 1900)
(AD-A110758; AFESC/ESL-TR-81-50) Avail: NTIS HC A03/MF A01 CSCL 06/6

Biodegradation of many of the components of Air Force fuels does occur, although most studies have been done under laboratory conditions, and the extrapolation of the findings to natural rates of biodegradation is premature. Many factors affect biodegradation rates, including the nature and concentration of the specific hydrocarbon compound, the species of bacteria present and their quantity, and environmental factors such as nutrient availability, temperature, and oxygen concentrations. Initial concerns should be first, the determination of the importance of biodegradation relative to other loss factors such as volatilization and sediment sorption, and second, the determination of the ultimate fate of recalcitrant compounds and their metabolites. Author (GRA)

N82-26897# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
INFLUENCE OF METEOROLOGICAL PROCESSES ON THE VERTICALITY OF ELECTRIC FIELDS Final Report, 1 Oct. 1978 - 30 Sep. 1981
Maynard L. Hill 15 Jan. 1982 16 p refs
(Contract N00024-78-C-5384; DA Proj. 1L1-61102-BH-57)
(AD-A111549; APL/ATO-P/MLH82-06; ARO-14830.1-GS) Avail: NTIS HC A02/MF A01 CSCL 04/1

A maneuverable atmospheric probe (MAP) was instrumented with atmospheric electric field sensors and operated at White Sands Missile Range to investigate meteorological affects on the verticality of electric fields. Verticality to within + or - 2 deg was found to be the norm for fair weather conditions that included a high degree of convective instability. Near a large mountain peak, it was observed that the field contours are favorable for deriving information that is useful for preventing collisions of aircraft with mountainous and other terrain protuberances. Author (GRA)

N82-26921*# Arizona State Univ., Tempe.
WIND TUNNEL MEASUREMENTS OF THREE-DIMENSIONAL WAKES OF BUILDINGS Final Report
Earl Logan, Jr. and Shu Ho Lin Washington NASA Jun. 1982 95 p refs
(Contract NAS8-32357)
(NASA-CR-3565; M-379; NAS 1.26:3565) Avail: NTIS HC A05/MF A01 CSCL 04B

Measurements relevant to the effect of buildings on the low level atmospheric boundary layer are presented. A wind tunnel experiment was undertaken to determine the nature of the flow downstream from a gap between two transversely aligned, equal sized models of rectangular cross section. These building models were immersed in an equilibrium turbulent boundary layer which was developed on a smooth floor in a zero longitudinal pressure gradient. Measurements with an inclined (45 degree) hot-wire were made at key positions downstream of models arranged with a large, small, and no gap between them. Hot-wire theory is presented which enables computation of the three mean velocity components, U, V and W, as well as Reynolds stresses. These measurements permit understanding of the character of the wake downstream of laterally spaced buildings. Surface streamline patterns obtained by the oil film method were used to delineate the separation region to the rear of the buildings for a variety of spacings. S.L.

N82-26939# Air Weather Service, Scott AFB, Ill. Aerospace Sciences Branch.
FORECASTING AIRCRAFT CONDENSATION TRAILS
Sep. 1981 25 p refs
(AD-A111876; AD-E850130; AWS/TR-81/001) Avail: NTIS HC A02/MF A01 CSCL 04/2

Aircraft condensation trails (contrails) are caused by aircraft aerodynamics or engine exhaust in the proper atmospheric conditions. Engine-exhaust trails are the most common and are discussed in this report. Jet aircraft contrail-formation graphs facilitate yes-or-no forecasts for any season with forecasts of pressure, temperature, and relative humidity. Contrail probability curves give condensation trail probabilities with forecast pressure and temperature. Engine power setting does not affect contrail formation, but does affect intensity. The contrail-formation graph for propeller aircraft is similar to the jet graph. GRA

N82-27009*# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
CONTROL OPTIMIZATION, STABILIZATION AND COMPUTER ALGORITHMS FOR AIRCRAFT APPLICATIONS Status Report, 15 Apr. 1981 - 15 May 1982
Michael Athans, ed. and Alan S. Willsky, ed. 15 May 1982 40 p refs
(Grant NGL-22-009-124)
(NASA-CR-169015; NAS 1.26:169015; LIDS-SR-1210; SR-28) Avail: NTIS HC A03/MF A01 CSCL 09B

The analysis and design of complex multivariable reliable control systems are considered. High performance and fault tolerant aircraft systems are the objectives. A preliminary feasibility study of the design of a lateral control system for a VTOL aircraft that is to land on a DD963 class destroyer under high sea state conditions is provided. Progress in the following areas is summarized: (1) VTOL control system design studies; (2) robust multivariable control system synthesis; (3) adaptive

Supplementary studies on the sensitivity of optimized structures
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OV-10A nose gear fork damage analysis
[AD-A111492] N82-25244

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In situ ozone data for comparison with laser absorption remote sensor: 1980 PEPE/NEROS program
[NASA-TM-84471] N82-25661

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Subsonic 3-D surface panel method for rapid analysis of multiple geometry perturbations
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16. Abstract

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AERONAUTICAL ENGINEERING

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A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in September 1982 in

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and maximizes reliability. The potential benefits of inlet and engine control integration are presently under study. The primary function of the air inlet control system is to position the three variable ramps in each inlet to some preset schedule of angles, so that ramp position is exclusively a function of Mach number. To achieve low total pressure distortion for static operation, total pressure recovery was intentionally lowered to minimize differences between average and minimum pressures. Analtyical estimates of aircraft forebody effects on the inlet flow field, using a three-dimensional inviscid supersonic flow field code, are found to be close to wind tunnel test results. Suggestions are made in light of study determinations for more advanced inlet designs. O.C.

A82-35279 # The performance of centrifugal compressor channel diffusers. C. Rodgers (Solar Turbines, Inc., Turbomach Div., San Diego, CA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-10.* 13 p. 14 refs. Members, $2.00; nonmembers, $4.00.

The most important performance criteria influencing maximum diffusion capability are formulated through the analysis of test results, for single-stage centrifugal compressors having backswept impellers and channel-type diffusers. The diffuser types considered are pipe, splitter, tandem, profiled L/E, channel, and slotted. It is determined that for any given stage, state surge occurred near a constant mean stream velocity diffusion ratio between the impeller tip and diffuser throat. While this diffusion ratio reached a maximum number of 1.8 for impeller tip Mach numbers lower than unity, it was not unique for all stages and was more strongly associated with throat blockage accumulation as a function of diffusion rate. Results of experiments in the vaneless space illustrate the sensitivity of the influence of flow in that region on centrifugal compressor performance. O.C.

A82-35285 # Semi-empirical analysis of liquid fuel distribution downstream of a plain orifice injector under cross-stream air flow. M.-H. Cao (Beijing Institute of Aeronautics and Astronautics, Beijing, People's Republic of China), H.-K. Jiang, and J.-S. Chin. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-16.* 9 p. Members, $2.00; nonmembers, $4.00.

An improved flat-fan spray model is used for the semi-empirical analysis of liquid fuel distribution downstream of a plain orifice injector under cross-stream air flow. The model assumes that, due to the aerodynamic force of the high-velocity cross air flow, the injected fuel immediately forms a flat-fan liquid sheet perpendicular to the cross flow. Once the droplets have been formed, the trajectories of individual droplets determine fuel distribution downstream. Comparison with test data shows that the proposed model accurately predicts liquid fuel distribution at any point downstream of a plain orifice injector under high-velocity, low-temperature uniform cross-stream air flow over a wide range of conditions. V.L.

A82-35287 # Casing wall boundary-layer development through an isolated compressor rotor. I. H. Hunter (Shell Research, Ltd., Chester, England) and N. A. Cumpsty (Cambridge University, Cambridge, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-18.* 13 p. 20 refs. Members, $2.00; nonmembers, $4.00.

A comprehensive series of measurements were made of the development of the casing wall boundary layer across an isolated compressor rotor having variable tip clearance with a view to revealing details of the flow phenomena. Time-averaged measurements of the outer-wall boundary layer downstream of the rotor were obtained using a conventional pressure probe, while a hot-wire anemometry technique yielded the three-dimensional blade-to-blade structure of the flow. The downstream boundary layer was found to thicken as the rotor blading and blade-end clearance were increased, with fluid tending to accumulate towards the pressure side of the passage. Results of the study should find application in multistage machines where the importance of casing boundary layers is particularly great. V.L.

A82-35288 # Secondary flows and losses in axial flow turbines. D. G. Gregory-Smith (Durham, University, Durham, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-19.* 4 p. 11 refs. Members, $2.00; nonmembers, $4.00.

A simple method is proposed for estimating secondary flow angles and losses in turbines which is suitable to form a subroutine of a larger design method. The secondary flow angles are calculated using classical secondary flow theory, while losses are estimated by identifying three sources of loss, calculating them independently, and adding them together. Initial results show that the method has the potential of yielding reliable estimates, while being much faster and easier to apply than viscous three-dimensional flow calculation methods. V.L.

A82-35289 # CFD technology for propulsion installation design - Forecast for the 80's. G. C. Paynter (Boeing Military Airplane Co., Seattle, WA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-21.* 8 p. 13 refs. Members, $2.00; nonmembers, $4.00.

One of the objectives of the present investigation is to provide an outline of the primary role of Computational Fluid Dynamics (CFD) in the aerospace industry and to clarify why CFD will be of increasing interest to industry in the 1980's. A second objective is to present current trends in CFD along with an explanation of these trends. Finally, key problem areas are defined which will pace the application of CFD technology by industry. In aircraft design procedures, the potential role of CFD is to minimize parametric model scale testing and use parametric analysis as the basis for configuration selection. Use of parametric analysis rather than parametric testing for design offers the advantages of reduced development cost, time, and risk. It also removes as a design contraint the existing test data base. Aspects of flow analysis technology development are discussed, taking into account numerics and mesh generation, turbulence modeling, and modeling and validation experiments. G.R.

A82-35290 # Smoke reduction in FJR-710 turbofan engines by an airblast combustor. K. Eguchi, A. Ishii (National Aerospace Laboratory, Chofu, Tokyo, Japan), K. Suzuki (Ministry of International Trade and Industry, Mechanical Engineering Laboratory, Ibaraki, Japan), K. Kitahara (Kawasaki Heavy Industries Co., Ltd., Hyogo, Japan), and T. Tagashira (Ishikawajima-Harima Heavy Industries Co., Ltd., Jet Engine Div., Tokyo, Japan). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-24.* 11 p. 18 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Ministry of International Trade and Industry of Japan.

An airblast fuel atomizer has been developed to reduce smoke emission levels in turbofan engines of the FJR-710 series. An annular combustor with the newly designed fuel atomizer was rig-tested in the presence of inlet airflow distortions over a wide range of inlet pressures and temperatures with a view to improving the combustor performance and reducing exhaust emissions through cowl and liner modifications. Smoke emission levels were below the visible limits for both main- and main/primary-fuel operations in the engine tests; levels at full-power conditions were found to meet the 1984 EPA standard for T2-class engines. There was no problem with flame instability or combustor durability. V.L.

A82-35292 # Thermal decomposition of aviation fuel. A. E. Peat (Rolls-Royce, Ltd., Derby, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-27.* 4 p. 5 refs. Members, $2.00; nonmembers, $4.00.

Thermal stressing of aviation fuels can promote the formation of fuel insoluble compounds. Their presence within the fuel system is troublesome to aviation gas turbine manufacturers as they can adversely affect engine performance. To study this phenomenon, an experimental program based on a fuel rig capable of reproducing relevant engine conditions and featuring an instrumented replica fuel injector feed arm was devised. The initial objectives are to rate quantitatively the effects of bulk fuel and metal temperatures, fuel flow rates, and fuel types on the production of fuel insoluble matter, both deposited and suspended. This report presents the initial results which indicate a relationship between the weight of 'tube' carbon deposits and a function of 'tube' metal temperature and fuel velocity. Further, this approach could provide an interface between the engine and laboratory test results. (Author)

A82-35293 # Plain-jet airblast atomization of alternative liquid petroleum fuels under high ambient air pressure conditions. A. K. Jasuja (Cranfield Institute of Technology, Cranfield, Beds., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-32.* 7 p. 5 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Ministry of Defence (Procurement Executive).

The effects that air and fuel properties have upon the spray mean drop size characteristics of a plain-jet airblast atomizer of the type employed in the gas turbine engine are investigated. The tests used kerosene, gas oil and a high-viscosity blend of gas oil in residual fuel oil, and covered a wide range of ambient air pressures. Laser light-scattering technique was employed for drop size measurements. It is concluded that the atomizer's measured mean drop size characteristics are only slightly different from those of the pre-filming type, especially when operating on low-viscosity kerosene under higher ambient air pressure. The beneficial effect of increased levels of ambient air pressure on mean drop size is shown to be much reduced in the case of high-viscosity fuels, thus making the attainment of good atomization performance on such fuels difficult. An expression is derived for correlating the obtained mean drop size data. C.D.

A82-35294 # Fuel microemulsions for jet engine smoke reduction. D. W. Naegeli and C. A. Moses (Southwest Research Institute, San Antonio, TX). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-33.* 10

p. 11 refs. Members, $2.00; nonmembers, $4.00. Contract No. F08635-79-C-0213.

Soot formation in gas turbine engines continues to be a threat to the operation and performance of aircraft. A recent problem is related to the control of smoke emissions from jet engine test cell facilities. A concept of water-in-fuel emulsions for the purpose of reducing smoke emissions from jet engine test cells was developed. However, some basic problems were encountered with water-in-fuel macroemulsions. Recently, methods were developed for creating 'microemulsions' of water-in-fuel and of alcohol-in-fuel. The present investigation has the objective to determine if the microemulsion concept could be used as a viable method to reduce exhaust smoke from gas turbine engines. It was found that if it is possible to formulate microemulsions involving fuel blends of both JP-4 and JP-8 with ethanol (aqueous), methanol, and water. Ethanol (anhydrous) is soluble in JP-4 and JP-8. Effects of these blends on combustion performance are related to the reduction of soot formation, exhaust smoke, and nitrogen oxide concentration. G.R.

A82-35295 # Investigation of blade vibration of radial impellers by means of telemetry and holographic interferometry. U. Haupt and M. Rautenberg (Hannover, Universität, Hanover, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-34.* 6 p. Members, $2.00; nonmembers, $4.00. Research supported by the Deutsche Forschungsgemeinschaft and Forschungsvereinigung Verbrennungskraftmaschinen.

Blade vibration measurements are carried out on a high-pressure, high-mass-flow, centrifugal compressor to determine the excitation mechanism in various operating ranges. Semiconductor strain gauges are used in the experiments, and an eight-channel telemetry system serves to transmit the signals. Blade vibration measurements are made for different operating ranges of the compressor, such as rotating stall and surge and flutter, and for the case of nonuniform flow conditions. The results of vibration tests with the impeller at rest show the stress distribution and the strain directions during blade vibration. This information is used for the choice of the strain gauge position on the blade. The experimental results are confirmed by a finite-element calculation considering a segment of the impeller with one blade, which determines the different vibration modes. In addition, the steady strain distribution of the impeller due to centrifugal force and temperature is calculated. The investigations are completed by optical measurements to find out the vibration modes of the different blades in rotating operation. The results reveal the various vibration modes of the blade up to a rotational speed of the compressor of 13,000 rpm. C.R.

A82-35296 # Acoustic control of dilution-air mixing in a gas turbine combustor. P. J. Vermeulen, J. Odgers (Université Laval, Quebec, Canada), and V. Ramesh (Calgary, University, Calgary, Alberta, Canada). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-35.* 12 p. Members, $2.00; nonmembers, $4.00. Natural Sciences and Engineering Research Council of Canada *Grant No. A-7801.*

A successful test carried out on a small combustor of normal design employing acoustic control of the dilution-air flows is described, noting that the combustor, even though tested at 'off-load' conditions, is much more representative of an engine combustor than the one described by Vermeulen and Odgers (1979). It is demonstrated that acoustic modulation of the dilution-air flows can be used to selectively and progressively control the exit plane temperature distribution. In particular, for an already good traverse quality, it is shown to be possible to trim the temperature profile; the results here are seen as sufficiently encouraging to warrant further development of the technique. It is thought that the study will contribute to the design of combustors in which a desired exit plane temperature distribution may be achieved. The acoustic drive is found to have no effect on the combustion efficiency. C.R.

A82-35298 # Experimental investigations on the flow in the impeller of a centrifugal fan. G. Caignaert, B. Desmet, and D. Stevenaert (Ecole Nationale Supérieure d'Arts et Métiers, Lille, France). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-37.* 6 p. 9 refs. Members, $2.00; nonmembers, $4.00.

A centrifugal research fan facility designed for pressure measurements on the impeller blades is described. Results of mean and fluctuating pressures are presented, showing the flow to be three-dimensional and rather unsteady. Also included is an analysis of rotating stall at low flow rates. The variations in the pressure distributions on the blade when the flow is varied reveal the influence of the angle of attack all along the blade leading edge and the importance of a good design of the inlet part of the blade in order to obtain better characteristics. The analysis of pressure fluctuations shows the important interaction with the volute, despite a large gap between the volute tongue and impeller. C.R.

A82-35299 # Small engine inlet air particle separator technology. H. L. Morrow and D. B. Cale (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-40.* 7 p. 18 refs. Members, $2.00; nonmembers, $4.00.

In connection with Army operations involving an employment of the newly developed airmobile concept, it was found that engine erosion problems, related to an ingestion of sand and dust, limited the average operational life of helicopter gas turbine engines to about 300 hours. A number of programs were initiated with the aim to study approaches for solving the corrosion problem. The Army finally elected to solve the problem by having the engine manufacturer develop the inlet protection system as part of the engine. This approach insures adequate development testing of the protection system concurrent with normal engine development and precludes quick-fix, after-the-fact development. It also results in the inclusion of the inlet protection system and its losses in the basic engine weight, volume, and performance. G.R.

A82-35300 # Conversion of centrifugal compressor performance curves considering non-similar flow conditions. W. Fister (Bochum, Ruhr-Universität, Bochum, West Germany) and J. Kotzur (Maschinenfabrik Augsburg-Nürnberg AG, Oberhausen, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-42.* 14 p. 22 refs. Members, $2.00; nonmembers, $4.00.

A detailed flow model of a radial compressor stage has been used to develop a new conversion method which makes it possible to consider, with few measurements, the effect of the most important parameters, such as Mach and Reynolds numbers, on energy transfer in the stage and flow losses. The new method is shown to provide a convenient, time-saving and sufficiently accurate way of converting performance characteristics within relatively wide ranges of peripheral Mach numbers and Reynolds numbers. Performance curves converted using the proposed method are presented and compared to measured values. V.L.

A82-35301 # On the influence of the number of stages on the efficiency of axial-flow turbines. G. Lozza, E. Macchi, and A. Perdichizzi (Milano, Politecnico, Milan, Italy). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-43.* 10 p. 12 refs. Members, $2.00; nonmembers, $4.00.

A computer code able to optimize significant design variables of a multi-stage axial-flow turbine is described, and the selection of optimizing design variables, constraint assumptions within which the solution is searched, and the optimization procedure used, are discussed. Losses are predicted by the Craig and Cox (1971) correlation. The design and performance prediction of a number of representative turbines is accomplished by a computer program, and similarity parameters are introduced to generalize the results obtained after a discussion of their physical significance for a multistage turbine's compressible flow. Turbine stage number influence on overall turbine efficiency is derived as a function of expansion ratio, specific speed and turbine dimensions. O.C.

A82-35302 # Secondary flow mixing losses in a centrifugal impeller. M. W. Johnson (Liverpool, University, Liverpool, England) and J. Moore (Virginia Polytechnic Institute and State University, Blacksburg, VA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-44.* 9 p. 13 refs. Members, $2.00; nonmembers, $4.00. Research supported by Rolls-Royce, Ltd.

A 'jet-wake' pattern has been observed in studies of outlet flows from centrifugal impellers. However, although impeller geometry, flow rate, and operating speed are known to influence the size and position of the wake, wake flows cannot be predicted reliably by current design methods. An improvement regarding the understanding of the wake flow would, therefore, be helpful in connection with efforts to optimize the performance of centrifugal compressors. In order to predict the development of the wake, it is necessary to investigate in detail the secondary flows which contribute to the thickening of the boundary layers on the suction surface and shroud walls. The present investigation is concerned with the determination of the flow phenomena which influence the development of the wake and its size and location in the impeller discharge flow. It is found that the secondary flows strongly influence the position of the wake in the outlet plane of a centrifugal impeller. G.R.

A82-35303 # The influence of flow rate on the wake in a centrifugal impeller. M. W. Johnson (Liverpool, University, Liverpool, England) and J. Moore (Virginia Polytechnic Institute and State University, Blacksburg, VA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-45.* 8 p. 11 refs. Members, $2.00; nonmembers, $4.00. Research supported by Rolls-Royce, Ltd.

A description is presented of the results of measurements made in a de Havilland Ghost centrifugal impeller running at low speed (500 rpm). All three mutually perpendicular components of relative velocity and the rotary stagnation pressure were measured on five cross-sectional planes between the inlet and the outlet of the impeller for three different flow rates. It was found that significant total pressure losses occur in two regions of the impeller, including the suction-side/-shroud corner region in the inducer at both the 'below design' and 'design' flow expression is derived for the dependence of the icing rate upon the studied parameters and comparison is made with the measured icing rate. For a range of temperatures from -21 to -8 C, the icing rate appears to be reduced by about 50 percent by the presence of large ice particles in concentrations above 5/L. C.D.

A82-36065 Evaluation criteria for aero engine materials (Bewertungskriterien für Werkstoffe des Flugtriebwerkbaues). P. Esslinger (Motoren- und Turbinen-Union München GmbH, Munich, West Germany). *Metall*, vol. 36, June 1982, p. 654-659. In German.

The criteria examined include lightweight construction, technological and economic properties, and reliability. Energy and raw materials consumption is a criterion steadily increasing in importance, especially when critical elements such as cobalt and chromium are involved. Substitutes for scarce materials are indicated. The quantitative prediction of materials failure is analytically discussed, and failure probability curves for a homogeneously stressed, rotating bar are given. Wöhler curves for strain tests on nickel materials are found along with maximum strain amplitudes for nickel materials of various yield points and failure values. C.D.

A82-36175 # An alternate test procedure to qualify future fuels for Navy aircraft. C. A. Moses, N. R. Sefer, and M. L. Valtierra (Southwest Research Institute, San Antonio, TX). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1233.* 9 p. 22 refs. Contract No. N00140-80-C-2269.

The U.S. Navy is experiencing pressures to modify the JP-5 fuel specification because of the growing shortage of high-quality crude oils from which kerosene can be simply distilled, and the increased costs of refining lesser quality crude oils to meet the current specification. A program has been initiated with the objective to study and develop a qualification procedure for future fuels. The purpose of the Alternative Test Procedure (ATP) would be to reduce the number of large-scale engine and flight tests required to develop confidence that a new fuel type will perform satisfactorily. Attention is given to future Navy aircraft fuels, the impact of future fuels on aircraft systems, aspects of hot section durability, materials compatibility, lubricity, cold day ignition, and thermal stability. It is concluded that an ATP to qualify future fuels is both necessary and feasible. G.R.

A82-36191 Digital spectral analysis of the noise from short duration impulsively started jets. I. S. Hodge, D. J. Smith, and N. H. Johannesen (Manchester, Victoria University, Manchester, England). *Journal of Sound and Vibration*, vol. 82, May 22, 1982, p. 171-179.

Techniques in which a shock tube is used to produce short duration jets are discussed briefly. The method adopted involves using the shock tube as a static reservoir with the jet exhausting through a nozzle originally closed by a diaphragm. Short duration noise samples of a Mach 0.9 air jet are recorded digitally and narrow band and one-third octave spectra are evaluated. Average spectra from a number of samples are presented. Comparison with both digital and analog spectra from the equivalent continuous jet demonstrates that it is possible to obtain meaningful spectra by averaging short duration samples of impulsively started jets. The technique is therefore suitable for the relatively cheap exploration of the noise field of jets of a wide variety of gases. (Author)

A82-36281 * # A single-frequency multitransmitter telemetry technique. V. A. Carreno (NASA, Langley Research Center, Flight Control Systems Div., Hampton, VA). *Instrument Society of America, International Instrumentation Symposium, 28th, Las Vegas, NV, May 3-6, 1982, Paper.* 9 p.

A telemetry technique for a special data collection system being developed for use on general aviation aircraft involved in aeronautical research programs is described. The system consists of a number of sensor-transmitter units at different locations on the aircraft, with individual signal conditioning and logic, which send sampled data signals to a single receiver in the airplane. The transmitters operate independently on the same frequency and are not synchronized to the receiver. The problem of reception of multiple samples simultaneously is treated by discarding such samples. An overlap detection technique for the frequency shift keyed modulation system is described. The amount of predicted data loss due to overlap is presented and compared with results obtained with a circuit implementation; the effects of discarded data on accuracy is discussed. (Author)

A82-36673 † Evaluating the effectiveness of hydrorefining of the low-stability component of T-1 fuel (Otsenka effektivnosti gidroochistki malostabil'nogo komponenta topliva T-1). A. A. Aliev, Kh. A. Akhmedov, L. G. Ismailova, and M. A. Mardanov (Akademiia Nauk Azerbaidzhanskoi SSR, Institut Neftekhimicheskikh Protsessov, Baku, Azerbaidzhan SSR). *Khimiia i Tekhnologiia Topliv i Masel*, no. 6, 1982, p. 27, 28. In Russian.

An experimental study has been carried out to investigate the possibility of improving the thermal stability of T-1 jet fuel by hydrorefining the component responsible for the low stability of T-1. The physicochemical properties of T-1 are presented along with the results of thermal stability tests before and after hydrorefining, showing that the thermal stability of the fuel increases by 3.8 times following hydrorefining. V.L.

A82-36937 The computerized cockpit for the one-man crew. M. Lambert. *Interavia*, vol. 37, June 1982, p. 608, 609.

The Demonstration Advanced Avionics System (DAAS), a NASA experiment, is an integrated computer system designed to produce information, guidance and control for the pilots of light aircraft, similar to that already in use in fighters and airliners. The DAAS system uses integrated displays from a central computer to provide data about navigation, flight status, aircraft configuration items and other similar matters to general aviation pilots. An improved version of the DAAS system offering greater reliability, smoother integration of analog sensors and with weather radar incorporated might become commercially available by the mid-1980s. A detailed block diagram of the system in included. N.B.

A82-36947 † The powerplants of the Yak-40 and M-15 aircraft (Silovaia ustanovka samoletov Iak-40 i M-15). V. K. Frantsev and N. A. Sherlygin. Moscow, Izdatel'stvo Transport, 1981. 232 p. 17 refs. In Russian.

The work examines the design, parameters, and operation of the powerplants of the Yak-40 and M-15 aircraft. Attention is given to the effect of changes in the modes and conditions of operation on the loading and mechanical stability of the engine parts. The physical principles underlying engine processes are described theoretically, and particular emphasis is placed on the operation of the engine, its systems and components. B.J.

A82-36950 † Assembly of aircraft instruments (Sborka aviatsionnykh priborov). A. V. Seleznev and V. A. Volokhov. Moscow, Izdatel'stvo Mashinostroenie, 1981. 312 p. 10 refs. In Russian.

The fundamentals of aircraft instrument manufacture are reviewed with reference to the design and performance characteristics of various instruments and basic fabrication processes. In particular, consideration is given to mechanical assembly, electrical assembly, testing, adjustment, and calibration of instruments. Instruments discussed include mechanical instruments with elastic sensing elements (e.g., pressure gages), electromechanical instruments, and gyroscopic instruments. The discussion also covers instrument reliability, process mechanization and automation, quality assurance, and, finally, worker safety and fire prevention. V.L.

A82-36969 * Justification for, and design of, an economical programmable multiple flight simulator. J. G. Kreifeldt (Tufts University, Medford, MA), J. Wittenber, and G. Macdonald. In: Manned systems design: Methods, equipment, and applications; Proceedings of the Conference, Freiburg im Breisgau, West Germany, September 22-25, 1980. New York, Plenum Press, 1981, p. 427-448. 9 refs. Grant No. NsG-2156.

The considered research interests in air traffic control (ATC) studies revolve about the concept of distributed ATC management based on the assumption that the pilot has a cockpit display of traffic and navigation information (CDTI) via CRT graphics. The basic premise is that a CDTI equipped pilot can, in coordination with a controller, manage a part of his local traffic situation thereby improving important aspects of ATC performance. A modularly designed programmable flight simulator system is prototyped as a means of providing an economical facility of up to eight simulators to interface with a mainframe/graphics system for ATC experimentation, particularly CDTI-distributed management in which pilot-pilot interaction can have a determining effect on system performance. Need for a multiman simulator facility is predicted on results from an earlier three simulator facility. G.R.

A82-36972 † Aviation meteorology (Aviatsionnaia meteorologia). A. M. Baranov and S. V. Solonin. Leningrad, Gidrometeoizdat, 1981. 384 p. 132 refs. In Russian.

The effect of meteorological conditions on airplanes and helicopters is considered. In the light of new aviation standards, the principles governing the use of meteorological data in aviation in order to improve the performance and safety of aircraft are set forth. Also considered are questions pertaining to the use of new equipment, including computers, for the collection, processing, and display of the meteorological information intended for aviation. C.R.

A82-36999 # Analysis of rotating structures using image derotation with multiple pulsed lasers and moiré techniques. J. C. MacBain, W. A. Stange (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH), and K. G. Harding (Dayton, University, Dayton, OH). In: Society for Experimental Stress Analysis, Spring Meeting, Dearborn, MI, May 31-June 4, 1981, Proceedings. Brookfield Center, CT, Society for Experimental Stress Analysis, 1982, p. 227-232. 10 refs.

Experiments were carried out on a bladed disk to study dual resonant modes under rotating conditions using image derotated holography and a Q-switched double-pulsed ruby laser. It is shown that hologram interferometry using image derotation is a valuable tool in studying the structural response of rotating bladed disks. It is also shown that the versatility and usefulness of the method can be extended even further by the use of triple-pulsed laser holography and some form of moiré analysis. V.L.

A82-37031 **The PATRIOT Radar in tactical air defense.** D. R. Carey (Raytheon Co., Bedford, MA) and W. Evans. In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 64-70.

The PATRIOT Radar is a C-band, phased array, multifunction radar that under the control of the Weapon Control Computer in the Engagement Control Station performs target search and track, missile search, track, and communications during midcourse guidance, and target-via-missile (TVM) terminal guidance. This paper describes the functions the radar performs and provides brief descriptions of the subsystems. The use of a multichannel, multifunction receiver and digital signal processor is emphasized to demonstrate the control and processing for multiple radar actions required to support the tactical air defense mission. A summary of results of an extensive test program at the White Sands Missile Range is presented. (Author)

A82-37034 **Simplified digital design tools.** S. M. Seltzer (Control Dynamics Co., Huntsville, AL). In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 145-150. 8 refs.

This paper presents a design philosophy for developing a digital control (or, guidance and control) system. The philosophy takes advantage of high-fidelity, high-order digital simulation tools coupled with low order analysis techniques that permit mathematical tractability. After describing that philosophy, the major portion of the paper is devoted to a description of three analytical digital design tools and how they can be used in concert. These tools are: (1) the Systematic Analytical Method (SAM) which is a method for obtaining mathematical relationships between desired system inputs and system outputs; (2) the Cross-Multiplication Method which provides a means of obtaining the time-domain response from the system closed-loop transfer function; and (3) the Digital Parameter Space Method which permits one to examine and specify the dynamics of a system. The use of these tools together is demonstrated in a simple example. (Author)

A82-37035 **C band spectral tracking for FM/CW altimetry.** T. O. Perkins, III (Kollsman Instrument Co., Merrimack, NH). In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 166, 167.

It is shown that the spectrum leading edge detection concept offers a highly accurate and reliable radar altimeter design with low transmit power and narrow receiver bandwidth. By avoiding frequency counters and short time measurements, many of the problems of more classical approaches can be eliminated. It is noted that the approach is also suitable for other applications where accurate distance measurement is required. Aside from the narrow bandwidth, the tracking discriminator response is balanced to cancel noise effects. Since propagation losses are 6 dB/octave for the entire altitude range, it is feasible to measure altitudes to 100,000 feet. C.R.

A82-37037 **An accurate Doppler navigator with microwave simplicity.** S. Monfort and G. Schaffner (Teledyne, Inc., San Diego, CA). In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 174-178.

This paper describes the extremely simple microwave circuitry of one of the most accurate Doppler navigation radars in use today. The radar consists of four microwave assemblies, a single diode solid state transmitter, a beam switch with one integrated circuit module, a fixed antenna assembly and a two-channel receiver in a single stripline board. (Author)

A82-37039 # **FAA tests on the Navstar GPS Z-set.** R. J. Esposito and E. M. Sawtelle (FAA, Technical Center, Atlantic City, NJ). In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 208-216. 6 refs.

The FAA independently determined the applicability of Navstar GPS for civil aviation through the flight and laboratory test of a Z-set receiver after this unit was acceptance tested aboard a USAF System Command C-141 aircraft. The acceptance flight tests were performed over the Yuma Proving Ground instrumented range. The FAA conducted initial tests in a twin turboprop engine Grumman Gulfstream from the Technical Center. The Z-set operated in a stand-alone (non-instrumented) configuration. Testing included satellite shielding studies, non-precision approaches to different airports, and operations in high noise/RFI environments (in the vicinity of airports, urban areas, radio and TV antenna towers, etc.). This paper summarizes the acceptance and the FAA familiarization test results. The paper also contains a brief description of completed and future tests for the instrumented Z-set with automated data acquisition systems. (Author)

A82-37040 **Navstar - Global Positioning System: A revolutionary capability.** W. C. Euler and J. W. Breedlove (Magnavox Advanced Products Co., Torrance, CA). In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 217-224.

A GPS user can obtain an accurate navigation fix at any time in any weather condition and in the presence of interference. Analyses sponsored by the DOD indicate that much of the initial cost of GPS (approximately five billion dollars) can be offset by discontinuing some present-day navigational systems. On the other hand, force enhancement considerations and other cost benefits could reach 50 billion dollars. This paper examines various aspects of GPS, including: global navigation accuracy; support for CCCI, military capability, survivability, cost effectiveness in regard to Nudet detection, tactical-warfare applications, and force enhancement. B.J.

A82-37061 # **Use of CGHRP in transport.** D. Short and J. Summerscales (Plymouth Polytechnic, Plymouth, Devon, England). In: Reinforced Plastics/Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 11-D). 4 p. 80 refs.

The applications of carbon fiber and glass fiber hybrid reinforced plastics in transport are reviewed with emphasis on benefits achieved by the reduction of weight or the improvement in performance relative to conventional structures. The applications discussed include car bodies, automotive driveshafts, automotive engine parts, yacht hulls, hovercraft blades, airframe structures, and helicopter rotors. Current trends in the field of hybrid plastics are the use of materials with intimately mixed finely dispersed fibers and wider use of thermoplastic matrices instead of the thermosets. V.L.

A82-37062 * # **Composite containment systems for jet engines.** G. T. Smith (NASA, Lewis Research Center, Cleveland, OH). In: Reinforced Plastics/-Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 12-A). 8 p.
(Previously announced in STAR as N81-17480)

A82-37065 # **A significant role for composites in energy-efficient aircraft.** G. A. Alther (Composite Aircraft Corp., Midland, TX). In: Reinforced Plastics/Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 12-D). 4 p. 7 refs.

The structural advantages and a 10-year in-service history of the Windecker Eagle all fiberglass/epoxy airframes are discussed. In these airframes, the skins are composed of one or more plies of nonwoven unidirectional fiber cloth, the wing spars and other laminates are also composed of multiple oriented plies of fiber cloth, and a ply of nonwoven 0/90 cloth is used for the outermost plies of the laminates and skins to enhance the finish. Stiffening for the skin laminates is provided by composite laminate stringers varying in thickness from 1/4 to 1 inch spaced with polyurethane foam. The fuselage is molded in one-piece halves complete with vertical tail, wing root, and stabilizer junctures, and bonded together at mating flanges along the top and bottom body lines. It is shown that apart from aerodynamics and energy efficiency, the all fiberglass/epoxy airframe provides greater strength, toughness, and redundancy compared to aluminum for equivalent structural weight. V.L.

A82-37071 # **Fabrication and test of integrally stiffened graphite/epoxy components.** L. M. Poveromo and J. A. Suarez (Grumman Aerospace Corp., Bethpage, NY). In: Reinforced Plastics/Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 17-A). 8 p. Contract No. F33615-78-C-5234.

A program has been initiated to demonstrate and validate low-cost skin stabilization manufacturing methods for composite designs which are cost-competitive with conventional full-depth aluminum honeycomb structures. The demonstration component selected is the trailing edge of the EF-111A horizontal stabilizer, for which cost data and maintenance experience are available. A production-suitable, vacuum-bag-cure manufacturing method developed for this integrally stiffened graphite/epoxy component is described, and static test results are presented for a full-size trailing edge. The life-cycle cost benefits derived from the use of the proposed manufacturing techniques are discussed. V.L.

A82-37074 # **Application and testing of metallic coatings on graphite/epoxy composites.** C. J. Staebler, Jr., G. Lubin (Grumman Aerospace Corp., Bethpage, NY), and M. Stander (U.S. Naval Air Systems Command,

CASCADE OF CORE TURBINE VANES AND COMPARISON WITH THEORY
Louis J Goldman and Richard G Seashultz Jun 1982 47 p refs
(NASA-TP-2018. E-876. NAS 1.60.2018) Avail NTIS HC A03/MF A01 CSCL 01A

Laser measurements were made in an annular cascade of stator vanes operating at an exit critical velocity ratio of 0.78. Velocity and flow angles in the blade to blade plane were obtained at every 10 percent of axial chord within the passage and at 1/2 axial chord downstream of the vanes for radial positions near the hub, mean and tip. Results are presented in both plot and tabulated form and are compared with calculations from an inviscid, quasi three dimensional computer program. The experimental measurements generally agreed well with these theoretical calculations, an indication of the usefulness of this analytic approach Author

N82-26235*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va
STATIC INTERNAL PERFORMANCE CHARACTERISTICS OF TWO THRUST REVERSER CONCEPTS FOR AXISYMMETRIC NOZZLES
Laurence D Leavitt and Richard J Re Jun 1982 24 p refs
(NASA-TP-2025. NAS 1.60:2025) Avail: NTIS HC A02/MF A01 CSCL 01A

The static performance of two axisymmetric nozzle thrust reverser concepts was investigated. A rotating vane thrust reverser represented a concept in which reversing is accomplished upstream of the nozzle throat, and a three door reverser concept provided reversing downstream of the nozzle throat. Nozzle pressure ratio was varied from 2.0 to approximately 6.0. The results of this investigation indicate that both the rotating vane and three door reverser concepts were effective static thrust spoilers with the landing approach nozzle geometry and were capable of providing at least a 50 percent reversal of static thrust when fully deployed with the ground roll nozzle geometry Author

N82-26236*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va
STEADY, OSCILLATORY, AND UNSTEADY SUBSONIC AND SUPERSONIC AERODYNAMICS, PRODUCTION VERSION 1.1 (SOUSSA-P1.1). VOLUME 2: USER/PROGRAMMER MANUAL. ADDENDUM 1: ANALYTICAL TREATMENT OF WAKE INFLUENCE
Herbert J Cunningham, Robert N Vesmarais, and E. Carson Yates Jr May 1982 3 p refs Addendum to NASA-CR-159131 See N80-29253
(Contract NAS1-14977)
(NASA-TM-84484 NAS 1.15:84484) Avail: NTIS HC A02/MF A01 CSCL 01A

The influence of the trailing wake at each wing panel center is investigated. The effect of the wake is calculated by analyzing the wake as being subdivided into trailing wake strips. With the improved program there are two optional ways of calculating the wake effect, and the choice is controlled by an added parameter KANW that is part of the input data S.L.

N82-26238*# Analytical Methods, Inc., Redmond, Wash
FLOWS OVER WINGS WITH LEADING-EDGE VORTEX SEPARATION
B M Rao and B Maskew Apr 1982 44 p refs
(Contract NAS1-16155)
(NASA-CR-165858. NAS 1.26:16585. Rept-8105) Avail: NTIS HC A03/MF A01 CSCL 01A

The unsteady cross flow analogy reduces the steady three dimensional separation flow problem into an unsteady two dimensional flow problem in which the section shape changes with time. The two dimensional VORSEP code is extended to the case of arbitrary body growth rates in order to generate the initial vortex structures for the three dimensional free vortex sheet (FVS) code. Automatic procedures to reduce the wing geometry definition to a set of cross flow plane sections corresponding to the locations of the time step solutions and to generate the effective source distribution on each cross flow section to represent the section normal growth across the following steps are incorporated in the VORSEP code. Also, the wake shedding model is improved by adopting a redistribution scheme which improves the stability of the free sheet development with time. The improved wake shedding model combined with the redistribution scheme alleviated the numerical instabilities associated with the vortex rollup S.L.

N82-26256# Rockwell International Corp., El Segundo, Calif. Aerodynamic Group.
SUPERSONIC CRUISE/TRANSONIC MANEUVER WING SECTION DEVELOPMENT STUDY Final Report, Aug. 1977 - Nov. 1979
Ellwood Bonner and Philip Gingrich Wright-Patterson AFB, Ohio AFWAL Jun. 1980 77 p refs
(Contract F33615-77-C-3066; AF Proj. 2404)
(AD-A110686; AFWAL-TR-80-3047) Avail: NTIS HC A05/MF A01 CSCL 01/3

Computational aerodynamic design of advanced fighter wings with well-controlled transonic maneuver flow and high supersonic cruise efficiency is described. Author (GRA)

N82-26258# Wright State Univ., Dayton, Ohio. School for Medicine.
UPDATE OF THE SUMMARY REPORT OF 1977-1978 TASK FORCE ON AIRCREW WORKLOAD Final Report, 1977 - 1979
William J. Cox, Fay Gold, and Richard L. Sulzer Washington FAA Apr. 1981 82 p refs
(AD-A112547; DOT/FAA/RD-81/34; DOT/FAA/ASF-300-81/2) Avail: NTIS HC A05/MF A01 CSCL 01/2

The 1978 summary of accident data from 1967 through 1976 has been extended through 1979. Comparing accident rates of aircraft types approved for operation by two crewmembers vs. accident rates for those approved for operation by three crewmembers, no indication of a safety problem relating to crew size was found. Over this three-year update period, accident rates per million departures were generally superior for the two-crew aircraft, the same result found for the earlier ten-year period. This nominal superiority is not considered a necessary result of flight deck configuration since there are other important differences in the operating environments of the various aircraft. A separate study has been made of the relationship between crew size and regulatory violations. This study, which is appended, produced no evidence that aircraft with crew size of two are being flown with less compliance than aircraft with a crew size of three Author (GRA)

N82-26259# General Accounting Office, Washington, D. C. Mission Analysis and Systems Acquisition Div
OPPORTUNITIES EXIST TO ACHIEVE GREATER STANDARDIZATION OF AIRCRAFT AND HELICOPTER SEATS
26 Feb. 1982 7 p
(AD-A111718, GAO/MASAD-82-22) Avail: NTIS HC A02/MF A01 CSCL 01/3

We reviewed the efforts of DOD and the services to standardize flight life-support equipment. While formal management structures and informal agreements have resulted in several standardized life-support items, we found a proliferation of tactical aircraft and helicopter seat systems, the most expensive items of life-support equipment. We believe that the past methods of acquiring seats have been costly; that standardization opportunities have not been adequately defined; and that for the most part, standardization efforts undertaken have not been adequately organized, planned, and supported either by DOD or the services. Increased management emphasis by the Under Secretary of Defense (Research and Engineering) and the services could increase standardization of aircraft seats and lower acquisition and support costs. Implementation of the Deputy Secretary of Defense's April 30, 1981, initiatives, which recognized that increased standardization of subsystems and support systems cannot only reduce life-cycle costs but also increase reliability, should result in additional economies Author (GRA)

N82-26260*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va.
MAGNETIC HEADING REFERENCE Patent Application
H. Douglas Garner, inventor (to NASA) Filed 9 Apr. 1982 19 p
(NASA-Case-LAR-12638-1; US-Patent-Appl-SN-367187) Avail: NTIS HC A02/MF A01 CSCL 17G

The invention relates to devices which vectorially sum the output signals from two magnetometers on an aircraft to produce a signal which is indicative of the error in the heading of the aircraft. This error in heading signal is used either by the pilot or an automatic control system to correct the heading. The device for generating a signal indicative of the difference between the actual heading and the selected heading of a vehicle is described. T.M.

N82-26261*# Systematics General Corp., Sterling, Va. Communications and Electronics Div.
FREQUENCY SHARING BETWEEN PASSIVE SENSORS AND AERONAUTICAL RADIONAVIGATION SYSTEMS EMPLOYING GROUND TRANSPONDERS IN THE BAND 4.2 - 4.4 GHz
Norman F. DeGroot Jan. 1982 21 p
(Contract JPL-955956)
(NASA-CR-169041; NAS 1.26:169041; JPL-9950-661) Avail: NTIS HC A02/MF A01 CSCL 17G

The 4.2 to 4.4 GHz band is reserved for radio altimeters aboard aircraft and for associated transponders on the ground. A radar altimeter system which utilizes associated ground transponders is described and the feasibility of co-channel operation of such a system with a typical passive sensor is analyzed. S.L.

N82-26262*# Systems Control, Inc., Palo Alto, Calif.
REAL-TIME SIMULATION OF AN AIRBORNE RADAR FOR OVERWATER APPROACHES Final Report, Nov. 1980 - Nov. 1981
J. Karmarkar and D. Clark Mar. 1982 132 p
(Contract NAS2-10479)
(NASA-CR-166293; NAS 1.26:166293) Avail: NTIS HC A07/MF A01 CSCL 17G

Software developed to provide a real time simulation of an airborne radar for overwater approaches to oil rig platforms is documented. The simulation is used to study advanced concepts for enhancement of airborne radar approaches (ARA) in order to reduce crew workload, improve approach tracking precision, and reduce weather minimums. ARA's are currently used for offshore helicopter operations to and from oil rigs. Author

N82-26263*# Colorado State Univ., Fort Collins. Dept. of Mechanical Engineering.
STUDY OF THE GLOBAL POSITIONING SYSTEM FOR MARITIME CONCEPTS/APPLICATIONS: STUDY OF THE FEASIBILITY OF REPLACING MARITIME SHIPBORNE NAVIGATION SYSTEMS WITH NAVSTAR Final Technical Report, 1 Jun. 1979 - 31 Dec. 1981
C. Byron Winn and W. Huston 31 Dec. 1981 23 p refs
(Grant NsG-5352)
(NASA-CR-169031; NAS 1.26:169031) Avail: NTIS HC A02/MF A01 CSCL 17G

A geostationary reference satellite (REFSAT) that broadcasts every four seconds updated GPS satellite coordinates was developed. This procedure reduces the complexity of the GPS receiver. The economic and performance payoffs associated with replacing maritime stripborne navigation systems with NAVSTAR was quantified and the use of NAVSTAR for measurements of ocean currents in the broad ocean areas of the world was evaluated. S.L.

N82-26264# Emerson Electric Co., Calabasas, Calif.
MODIFICATION OF OE-258/URN TACTICAL AIR NAVIGATION (TACAN) ANTENNA GROUP Final Report, Oct. 1980 - Jul. 1981
James D Bain Washington FAA Jul. 1981 70 p refs
(Contract DTF01-80-C-10148)
(AD-A111680, FAA-RD-81-53) Avail: NTIS HC A04/MF A01 CSCL 09/5

The OE-258/URN TACAN Antenna Group has been modified to provide a remote monitor capability. This remote monitor meets the requirements of the IEEE-488 interface specification. A test set (controller) has been provided for use with the antenna group. Author (GRA)

N82-26265# Naval Postgraduate School, Monterey, Calif. Dept. of Physics and Chemistry.
A LABORATORY EVALUATION OF THE SUITABILITY OF A XENON FLASHTUBE SIGNAL AS AN AID-TO-NAVIGATION M.S. Thesis
Donald Francis Murphy Dec. 1981 109 p refs
(AD-A110729) Avail: NTIS HC A06/MF A01 CSCL 17/7

Single flick xenon flashtubes have periodically been used by the U.S. Coast Guard as visual signals on marine aids-to-navigation. Their deployment has met with mixed responses. The conspicuity of the signal is excellent; it stands out among other visual signals, both flashing and steady lights. However, the flick is apparently too short, approximately 100 micro sec, for the mariner to fixate on it. He, therefore, is unable to make an accurate judgement concerning the distance to the light. This thesis utilized a Howard-Dolman Box to examine the depth perception of subjects under various flashing light conditions. Author (GRA)

N82-26266# Arinc Research Corp., Annapolis, Md.
LIFE-CYCLE-COST ANALYSIS OF THE MICROWAVE LANDING SYSTEM GROUND AND AIRBORNE SYSTEMS Final Report, 21 Oct. 1980 - 1 Sep. 1981
A. Schust, P. Young, and K. Peter Washington FAA Oct. 1981 348 p
(Contract DOT-FA76WA-2547)
(AD-A110909; Rept-1326-01-16-2547; FAA-RD-81-96) Avail: NTIS HC A15/MF A01 CSCL 01/4

This report presents the results of a life-cycle-cost analysis of the Microwave Landing System ground and airborne configurations that may be implemented for the National Airspace System. The ground configurations evaluated consisted of 3 deg, 2 deg, and 1 deg beamwidth azimuth subsystems. The airborne configurations evaluated were for air carrier aircraft, high-performance general aviation aircraft, and low-performance general aviation aircraft. Author (GRA)

N82-26267# Defense Mapping Agency, Washington, D.C. Advanced Technology Div.
GLOBAL POSITIONING SYSTEM (GPS) GEODETIC RECEIVERS
Walter J. Senus 8 Feb. 1982 5 p refs
(AD-A111026) Avail: NTIS HC A02/MF A01 CSCL 17/7

The NAVSTAR Global Positioning System (GPS) when fully developed will provide world-wide, all weather, continuous, highly accurate radio navigation support to the full spectrum of military uses. In addition it has the potential to revolutionize the navigational capability of the civil sector as well. The Defense Mapping Agency, in conjunction with other government agencies in sponsoring the development of GPS user equipment which will benefit greatly the Mapping, Charting, and Geodesy (MC&G) Community. Among these developments are GPS receivers for geodetic survey applications. GPS geodetic receivers are being built around several operating modes, each of which has its advantages. The GPS program as well as the various techniques being pursued are briefly reviewed. Data collected to date is reported which indicated excellent performance both in the point positioning mode and in the distance difference mode of operation. Further the anticipated improvement in measurement accuracy will be provided with a corresponding reduction in time required to occupy a measurement site and therefore offers operational cost reductions. Author (GRA)

N82-26268# Defense Mapping Agency Hydrographic and Topographic Center, Washington, D.C.
A COMPARISON OF POLE POSITIONS DERIVED FROM GPS SATELLITE AND NAVY NAVIGATION SATELLITE OBSERVATIONS
William H. Wooden, II 6 Jan. 1982 18 p refs Presented at the 3rd Intern. Geodetic Symp. on Satellite Doppler Positioning
(AD-A110765) Avail: NTIS HC A02/MF A01 CSCL 17/7

The observation of the motion of the Earth's spin axis with respect to the crust has been done continuously since the latter part of 1899 by the International Service. With the advent of new technologies, new determinations of polar motion have been possible. Doppler tracking of the Navy Navigation Satellites has provided estimates of the polar motion on a permanent basis since 1969. Currently, these estimates are done at the Defense Mapping Agency and are distributed to several agencies including the Bureau International de l'Heure (BIH), which has the responsibility of centralizing polar motion data. The NAVSTAR Global Positioning System (GPS) is a new navigation satellite system which will eventually replace the existing Navy Navigation Satellite System. As a byproduct of the orbit estimation process for the GPS satellites, values for the position of the pole are determined. In this paper the two different methods for computing the pole's position from satellite observations are described. The most recent results from each method are compared to each other and to the standard BIH values. Author (GRA) control systems: (4) failure detection algorithms: and (5) fault tolerant optimal control theory Author

N82-27088*# Kansas Univ Center for Research, Inc., Lawrence. Flight Research Lab

A RESEARCH PROGRAM TO REDUCE INTERIOR NOISE IN GENERAL AVIATION AIRPLANES. INFLUENCE OF DEPRESSURIZATION AND DAMPING MATERIAL ON THE NOISE REDUCTION CHARACTERISTICS OF FLAT AND CURVED STIFFENED PANELS Progress Report

Ramasamy Navaneethan, Barry Streeter, Steven Koontz, and Jan Roskam Oct 1981 310 p refs
(Contract NCC1-6)
(NASA-CR-169035; NAS 1.26:169035; KU-FRL-417-17) Avail: NTIS HC A14/MF A01 CSCL 20A

Some 20 x 20 aluminum panels were studied in a frequency range from 20 Hz to 5000 Hz. The noise sources used were a swept sine wave generator and a random noise generator. The effect of noise source was found to be negligible. Increasing the pressure differential across the panel gave better noise reduction below the fundamental resonance frequency due to an increase in stiffness. The largest increase occurred in the first 1 psi pressure differential. The curved, stiffened panel exhibited similar behavior, but with a lower increase of low frequency noise reduction. Depressurization on these panels resulted in decreased noise reduction at higher frequencies. The effect of damping tapes on the overall noise reduction values of the test specimens was small away from the resonance frequency. In the mass-law region, a slight and proportional improvement in noise reduction was observed by adding damping material. Adding sound absorbtion material to a panel with damping material beneficially increased noise reduction at high frequencies. A.R.H.

N82-27089*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

ON THE DESIGN AND TEST OF A LOW NOISE PROPELLER Final Report

George P. Succi Nov. 1981 52 p refs
(Contract NAS1-16521)
(NASA-CR-165938; NAS 1.26:165938; Rept-4764) Avail: NTIS HC A04/MF A01 CSCL 20A

An extensive review of noise and performance of general aviation propellers was performed. Research was done in three areas. The acoustic and aerodynamic theory of general aviation propellers, wind tunnel tests of three one-quarter scale models of general aviation propellers, and flight test of two low noise propellers. The design and testing of the second propeller is reviewed. The general aerodynamic considerations needed to design a new propeller are described. The design point analysis of low noise propellers is reviewed. The predicted and measured noise levels are compared. Author

N82-27090*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering

ACOUSTIC PROPERTIES OF TURBOFAN INLETS Final Technical Report, 1 Sep. 1974 - 31 Oct. 1981

Ben T. Zinn, Robert K. Sigman, and Scott J. Horowitz 31 Oct. 1981 6 p refs
(Grant NsG-3036)
(NASA-CR-169016; NAS 1.26:169016) Avail: NTIS HC A02/MF A01 CSCL 20A

The acoustic field within a duct containing a nonuniform steady flow was predicted. This analysis used the finite element method to calculate the velocity potential within the duct. S.L.

N82-27191*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

BIBLIOGRAPHY OF LEWIS RESEARCH CENTER TECHNICAL PUBLICATIONS ANNOUNCED IN 1981

May 1982 295 p
(NASA-TM-82838; E-1205; NAS 1.15:82838) Avail: NTIS HC A13/MF A01 CSCL 05B

Technical reporting that resulted from the scientific and engineering work performed and managed by the Lewis Research Center in 1981 are indexed and abstracted. All the publications were announced in the 1981 issues of STAR (Scientific and Technical Aerospace Reports) and/or IAA (International Aerospace Abstracts). Included are research reports, journal articles, conference presentations, patent applications and theses. A total of 384 technical publications is listed. Author

N82-27216# Air Force Academy, Colo. Dept. of Aeronautics.

AIR FORCE ACADEMY AERONAUTICS DIGEST: SPRING/SUMMER 1981 Final Report

A. M. Higgins, ed., F. M. Jonas, ed., E. J. Jumper, ed., J. M. Kempf, ed., and B. Gregory, ed. Dec. 1981 110 p refs
(AD-A112421; USAFA-TR-81-11) Avail: NTIS HC A06/MF A01 CSCL 20/4

This Digest covers unclassified research in aeronautics performed at the United States Air Force Academy during the six months ending 15 July 1981. This report includes technical papers in the specific areas of aerodynamics, propulsion, experimental instrumentation, engineering education and aeronautical history. Topics include: The Mass Flux Surface Boundary Condition for Linarized Potential Flow; A Numerical Investigation of the Effects of Fin Planform Parameters on the Subsonic Cruise Performance of a Supersonic Arrow Wing Configuration; An Improved Method for Calculation of Static Thrust for the USAFA J-85/13 Turbojet Engine; Pressure Measurement Using a High-Speed Data Acquisition and On-Line Calibration System; Cadet Performance during Summer Academics-Repeat versus non-repeat students; Reflections of an English Literature Major on Our Technological Society; and The Evolution and Future of Aeropropulsion Systems. GRA

N82-27217# Logistics Management Inst., Washington, D. C.

DEPOT SUPPORT OF GAS TURBINE ENGINES Final Report

T. J. OMalley and David V. Glass Oct. 1981 39 p
(Contract MDA903-81-C-0166)
(AD-A107141; LMI-ML103) Avail: NTIS HC A03/MF A01 CSCL 15/5

This report assesses the DoD's capacity and capability to support the depot maintenance requirements of gas turbine engines over the next 5-10 years. Special attention is given to newer nonaeronautical applications (tanks, marine propulsion, and cruise missile). Gas turbine engines used in fixed and rotary wing aircraft will continue to dominate the engine workload; the gas turbines used in cruise missiles, tanks, and ships will comprise less than 10 percent of the total engine workload by 1990. Additional depot maintenance capacity to support gas turbine engines is not required. The depots have adequate capacity today, and since the gas turbine workload is projected to increase by only 6 percent between FY 82 and FY 87, capacity should remain adequate through the 1980s. The Military Departments have the required capabilities to support the new nonaeronautical gas turbine engines entering the DoD inventory. They have repaired similar engines, both in size and technology, for several years. Author (GRA)

N82-27218# Office of Naval Research, London (England).

A TECHNICAL ASSESSMENT OF AERONAUTICAL ENGINEERING IN ISRAEL

Joseph A. Strada 1 Jul. 1981 8 p refs
(AD-A106980; ONRL-R-5-81) Avail: NTIS HC A02/MF A01 CSCL 01/3

A variety of Israeli academic and industrial institutions are discussed with an eye toward assessing research and development activities in aeronautical engineering disciplines. Each institution is described in brief and some of its current research projects are listed. Research in aerodynamics, guidance and control, propulsion and combustion is discussed and industrial product lines are described where appropriate. Some conclusions are drawn in an effort to assess the country's overall capabilities in aeronautical engineering. Author (GRA)

N82-27219# General Accounting Office, Washington, D. C. Mission Analysis and Systems Acquisition Div.

OPPORTUNITIES TO REDUCE THE COST OF SOME B-52 MODIFICATIONS Report to Secretary of Defense

9 Apr. 1982 7 p
(AD-A113563; GAO/MASAD-82-30) Avail: NTIS HC A02/MF A01 CSCL 05/1

As part of our ongoing review of the overall modernization of the strategic bomber force, we have paid particular attention to the Air Force's plans for modifying the B-52 force. We found that certain costly items may not be needed in view of the missions of the various models of the B-52 force and their expected life in the force. More specifically, the offensive avionics system (OAS) modification could be scaled back on 67 B-52Gs by deleting unneeded components for a potential savings of $21.6 million; using certain components acquired for B-52Ds on other B-52 aircraft could further reduce OAS funding needs by $33.3 million; and a $35 million modification to comply with SALT II may not be needed on B-52Hs that have been modified to carry cruise missiles. GRA

N82-27220# RAND Corp., Santa Monica, Calif.

PREPLANNED PRODUCT IMPROVEMENT AND OTHER MODIFICATION STRATEGIES: LESSONS FROM PAST AIRCRAFT MODIFICATION PROGRAMS Interim Report

Frederick Biery and Mark Lorell Dec. 1981 78 p refs
(Contract F49620-82-C-0018)
(AD-A113599; RAND/N-1794-AF) Avail: NTIS HC A05/MF A01 CSCL 15/5

Pre-Planned Product Improvement (P31) is a weapon system acquisition strategy formulated in the late 1970s in a response to the high development costs of new systems, lengthening acquisition intervals, increasing age of current inventories, constrained budgets, and various technology trends. It is founded on the assumption that quality enhancement modification of existing inventory systems is a cheaper and quicker way to modernize than the development of entirely new systems. The P31 strategy is aimed at facilitating this process; its central element is the design of new systems from their origins to accommodate future quality upgrades. Discussion of the merits and disadvantages of P3I, however, remains abstract and theoretical. This Note reviews the circumstances that led to the formulation of P3I, clarifies the implications of the concept and offers an initial assessment of the policy as applied to aircraft systems based on a careful and extensive examination of past major aircraft modification efforts. The authors conclude that long-range pre-planning during the design stage is impractical. This note also provides lessons drawn from past experience on the conduct of modification programs in general. Author (GRA)

N82-27221# Clemson Univ., S.C. Dept. of Mathematical Sciences.

SPECIFICATION AND ESTIMATION OF DYNAMIC COST FUNCTIONS FOR AIRFRAME PRODUCTION AIRFRAMES

Thomas R. Gulledge, Jr. Dec. 1981 185 p refs
(Contracts N00014-75-C-0451; F33615-81-K-5116; NR Proj. 365-049)
(AD-A113147; N135) Avail: NTIS HC A09/MF A01 CSCL 14/1

The cost behavior of the airframe industry is unique. Cost minimization models are specified that have potential for modeling this unique production situation. These models are firmly grounded in economic theory, and they stress the importance of learning and production rate as determinants of program costs. As an empirical application, one of the models is applied to the F102 airframe program. Author (GRA)

N82-27225# Naval Ship Research and Development Center, Bethesda, Md.

PROCEEDINGS OF THE 12TH NAVY SYMPOSIUM ON AEROBALLISTICS, VOLUME 1

May 1981 451 p refs Symp. held at Bethesda, Md., 12-14 May 1981 2 Vol.
(AD-A111763) Avail: NTIS HC A20/MF A01 CSCL 20/4

Partial Contents: Missile Aerodynamics; Aerodynamics of Tactical Weapons to Mach No. 8 and Angle of Attack 180 Deg.; An Inviscid Computational Method for Tactical Missile Configurations; Triservice Data Base Extension of PROGRAM MISSILE; Theoretical and Experimental Supersonic Lateral-Directional Stability Characteristics, Aerodynamics of a Rolling Airframe Missile, Approximate Method for Predicting Supersonic Normal Force Coefficient of Very-low-aspect-ratio Lifting Surfaces; Supersonic Aerodynamics of a Class of Cone-Derived Waveriders; Determination of Aerodynamic Characteristics of Ballistic Projectiles at Transonic Speeds; Store Separation; Study of Flow Fields and Store Forces in Close Proximity to a Triple Ejection Rack at Transonic Speeds; Computer Program for Simulating the Six-Degree-of-Freedom Motion of Missile Debris Fragments; An Influence Function Method for Predicting Aerodynamic Characteristics during Weapon Separation; Submissile Aerodynamics during Dispensing; Gun Launch Dynamics of the Navy 5-Inch Guided Projectile; Dynamics of Subsonic Tracer Projectiles; Thrust Augmentation for Tomahawk Cruise Missile; and Drag Characteristics and Suitability of Three-Foot Long Parachute Decelerators. GRA

N82-27233*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CHARACTERISTICS OF FUTURE AIRCRAFT IMPACTING AIRCRAFT AND AIRPORT COMPATIBILITY

D. William Conner May 1982 28 p refs
(NASA-TM-84476; NAS 1.15:84476) Avail: NTIS HC A03/MF A01 CSCL 01C

Results are reported of an opinion survey of selected individuals at the decision-making level within the five major manufacturers of transport aircraft in the United States and Europe. Opinions were obtained concerning both possible and probable existence of over 50 compatibility-related characteristics of transport aircraft in use in the years 1990, 2000, and 2010. The maximum size of aircraft is expected to increase, at a roughly uniform rate, to the year 2010 by 85 percent in passengers, 55 percent in airfreighter payload, and 35 percent in gross weight weight. Companion to the expected growth in payloads and gross weight was the identification of probable increases in aircraft geometrical dimensions and component capability, and use of fully double-decked passenger compartments. Wing span will increase considerably more than normally expected to provide wings of higher aspect ratio. New aircraft features coming into probable use include large turboprops, synthetic jet-A fuel, winglets, wake-vortex-reducing devices and laminar flow control. New operational concepts considered probable include steep approaches, high-speed turnoffs, and taxiway towing for the aircraft, plus passenger bypass of the terminal building, expedited handling of belly cargo and an intermodal cargo container for the payloads. B.W.

N82-27235*# National Aeronautics and Space Administration, Washington, D. C.

AERODYNAMIC INVESTIGATIONS TO DETERMINE POSSIBLE ICE FLIGHT PATHS

W. Burgsmueller, H. Frenz, P. May, and G. Anders Mar. 1982 77 p Transl. into ENGLISH of Vereinigte Flugtechnische Werke--Fokker GMBH Rept-Ef-586, 18 Jan. 1977 84 p Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76648; NAS 1.15:76648) Avail: NTIS HC A05/MF A01 CSCL 01C

After flights with the VFW 614 under severe icing conditions, damage to the engine was found. In wind tunnel tests a determination of the origin of this ice was made; it is supposed that the damage was caused by this ice. On the modified flight test model of the VFW 614 on a 1:15 scale, measurements were conducted in the VFW-Fokker wind tunnel with exposed particles which represented the free ice. The results of this testing are presented. Author

N82-27236# Boeing Commercial Airplane Co., Seattle, Wash. Systems Technology Div.

AIRCRAFT ALERTING SYSTEMS STANDARDIZATION STUDY. VOLUME 1: CANDIDATE SYSTEM VALIDATION AND TIME-CRITICAL DISPLAY EVALUATION Final Report, Feb. - Nov. 1980

G. P. Boucek, D. A. Po-Chedley, B. L. Berson, D. C. Hanson, M. F. Leffler, and R. W. White Jan. 1981 116 p refs
(Contract DOT-FA79WA-4268)
(AD-A107225; FAA/RD-81/38/1) Avail: NTIS HC A06/MF A01 CSCL 01/2

This report is one of a series of documented studies directed to the improvement and standardization of aircraft alerting systems. The purpose of the study was to develop and validate, through simulation, functional design criteria that can be used in designing effective aircraft alerting systems. The major objectives of this phase study were to: resolve system component questions; validate the two candidate system concepts by comparison to a representative baseline system, for both the pilot and flight engineer stations; evaluate presentation media and display formats for time-critical warnings; develop guidelines for the design of alerting systems. The system component questions were resolved in a series of experiments and the results were integrated into two system concepts for validation. In the validation tests, line-qualified pilots exercised the three alerting systems in a full-mission, fixed-base simulator. In all areas of measurement pilot performance was as good or better with the two candidate system designs than with the conventional, baseline system. The results indicate that a flight engineer station should contain the visual display components offered by the candidate system concepts. Voice was the recommended medium of presentation when rapid response is required. The time-critical display tests showed that fastest pilot response performance was obtained when graphic guidance alerts were placed in the

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International aerospace review; Proceedings of the First International Aerospace Symposium, Le Bourget, Seine-Saint-Denis, France, June 2, 3, 1981
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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering – A Continuing Bibliography* (NASA SP-7037) lists 535 reports, journal articles, and other documents originally announced in September 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

An annual cumulative index will be published.

rates, and the final radial section of the impeller at all three flow rates. The losses in the inducer are the result of an adverse pressure gradient in the streamwise direction in the suction-side/shroud corner region, which causes the separation of the boundary layer. The separation point moves downstream as the flow rate is increased, until, at the 'above design' flow rate, separation losses are entirely avoided in the inducer. G.R.

A82-35304 # **Secondary flow effects and mixing of the wake behind a turbine stator.** A. Binder and R. Romey (Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt, Institut für Antriebstechnik, Cologne, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-46.* 9 p. 16 refs. Members, $2.00; nonmembers, $4.00.

The increase in secondary flow effects of highly loaded turbines with large hub/tip ratios is investigated for the case of a single-stage turbine with cold air flow, whose stator was designed for transonic flow and has a hub/tip ratio of 0.756. After taking measurements without the rotor in several sections behind the turbine stator, with attention to wake mixing and secondary vortices, the magnitude of the mixing losses is derived from the distributions of total pressure loss coefficient and flow direction. The position, intensity structure and development of secondary vortices are also obtained. Complementary five-hole probe measurements confirm the earlier, two-dimensional measurement results. O.C.

A82-35306 # **The low temperature properties of aviation fuels.** G. Brunton, R. R. Willock, and M. A. Voisey (Shell Research, Ltd., Thornton Research Centre, Chester, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-48.* 10 p. 15 refs. Members, $2.00; nonmembers, $4.00.

In connection with easing major constraints regarding the aviation fuel market in connection with increasing fuel demands and decreasing supplies, it is desirable to identify ways of moderating specification requirements which will enhance flexibility, but at the same time maintain product quality. One of the important specification requirements that can constrain fuel availability is the freezing point. A description is presented of research into the low-temperature properties of aviation fuels conducted by a major oil company. Attention is given to the need to define the low-temperature specification requirement, tank studies, the effect of fuel composition on low-temperature properties, current efforts, and the consequences of utilizing a flow-related low-temperature specification requirement. G.R.

A82-35307 * # **Deposit formation in hydrocarbon fuels.** R. Roback, E. J. Szetela, and L. J. Spadaccini (United Technologies Research Center, East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-49.* 9 p. 9 refs. Members, $2.00; nonmembers, $4.00. Contract No. NAS3-22277.

The hydrocarbon fuels RP-1, commercial-grade propane, JP-7 and chemically pure propane were subjected to tests in a high pressure fuel coking apparatus in order to evaluate their thermal decomposition limits and carbon deposition rates in heated copper tubes. A fuel thermal stability parametric evaluation was conducted at 136-340 atmospheres, bulk fuel velocities of 6-30 m/sec, and tube wall temperatures of 422-811 K, and the effect of inside wall material on deposit formation was evaluated in tests using nickel-plated tubes. Results show RP-1 deposit formation at wall temperatures between 600 and 800 K, with peak deposit formation near 700 K. Substitution of deoxygenated JP-7 for RP-1 showed no improvement, and the carbon deposition rates for propane fuels were found to be higher than those of either of the kerosene fuels. Nickel plating of the tube walls significantly reduced RP-1 carbon deposition rates. O.C.

A82-35310 # **Development and application of Dabber gas tungsten arc welding for repair of aircraft engine, seal teeth.** J. F. Rudy (General Electric Co., Aircraft Engine Business Group, Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-55.* 4 p. Members, $2.00; nonmembers, $4.00.

It has been recognized that the task of rebuilding worn seal teeth on rotating parts of gas turbine engine hardware is an important part of any program for the reduction of the operating costs of these engines. A procedure for performing the required repair operations for such a task is discussed. Attention is given to the development of a welding technique which places a minimum puddle volume and a small width build-up on top of a continuous narrow edge, to achieve a minimal heat affected zone and minimum shrinkage, in the absence of cold overlaps or other weld defects. A process which worked significantly better than other procedures investigated was to 'dab' the filler wire into the puddle or arc plasma zone. Aircraft gas turbine engine components with seal teeth repaired by the 'Dabber' welding method are now performing satisfactorily in commercial service. G.R.

A82-35311 # **EAGLE - An interactive engine/airframe life cycle cost model.** E. J. Reed, R. R. Horton, and J. B. Fyfe (United Technologies Corp., Government Products Div., West Palm Beach, FL). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-56.* 7 p. Members, $2.00; nonmembers, $4.00. Contracts No. N00019-80-C-0225; No. F33657-77-C-0403; No. F33657-78-C-0256.

The DOD is placing increased emphasis on procedures for predicting and tracking the cost of developing, procuring, and supporting weapon systems over their life cycles. The DOD has also begun to state weapon system requirements in terms of mission to be accomplished rather than specific hardware. The net effect of these and other similar DOD actions has been to require weapon system contractors to expand their system analysis capability to meet DOD requirements. A description has been presented of the Engine/Airframe Generalized Life Cycle Cost Evaluator (EAGLE) model, which has been developed by an American aerospace company primarily to evaluate the influence of engine design decisions on the total weapon system. To accomplish this, an adequate accounting and understanding of engine/airframe interaction, mission impact, engine performance, maintenance, and cost effects was a prerequisite. G.R.

A82-35312 * # **Experimental study of external fuel vaporization.** E. J. Szetela and J. A. TeVelde (United Technologies Research Center, East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-59.* 8 p. 9 refs. Members, $2.00; nonmembers, $4.00. Contract No. NAS3-21971.

The fuel properties used in the design of a flash vaporization system for aircraft gas turbine engines were evaluated in experiments using a flowing system to determine critical temperature and pressure, boiling points, dew points, heat transfer coefficients, deposit formation rates, and deposit removal. Three fuels were included in the experiments: Jet-A, an experimental referree broad specification fuel, and a premium No. 2 diesel fuel. Engine conditions representing a NASA Energy Efficient Engine at sea-level take-off, cruise, and idle were simulated in the vaporization system and it was found that single phase flow was maintained in the heat exchanger and downstream of the throttle. Deposits encountered in the heat exchanger represented a thermal resistance as high as 1300 sq M K/watt and a deposit formation rate over 1000 gC/sq cm hr. C.D.

A82-35314 # **Atomization quality of twin fluid atomizers for gas turbines.** M. M. Elkotb, M. A. E. Mahdy (Cairo University, Cairo, Egypt), and M. E. Montaser (Egyptian Army, Egypt). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-61.* 10 p. 17 refs. Members, $2.00; nonmembers, $4.00.

The flow and atomization performance characteristics of external mixing twin fluid atomizers, which were tested over a wide range of geometries and operating conditions, are discussed. Attention is given to such factors as nozzle/needle diameter ratio, normal fuel area, cone angle, and droplet size distribution. It is found that the flow rate increases with nozzle/needle diameter ratio and fuel nozzle area, as well as with an increase of fuel pressure and decrease of air pressure. A dimensional relation is derived which accurately predicts flow number. Functions are also derived for droplet size distribution and Sauter mean diameter, which can together with that for flow number be used in the prediction of fuel concentration and heat release. O.C.

A82-35315 # **The effect of coolant flow on the efficiency of a transonic HP turbine profile suitable for a small engine.** G. W. Michel (Rolls-Royce, Ltd., Aero Div., Bristol, England) and F. H. Kost (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für experimentelle Strömungsmechanik, Göttingen, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-63*10 p. 10 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Ministry of Defence (Procurement Executive).

In connection with plans for improving gas turbine efficiency by raising the operational temperature, an investigation has been conducted concerning the design of a suitable engine cooling procedure. The investigation involved a study of the aerodynamic penalties of coolant flow for various configurations of coolant flow. Tests were carried out to investigate the effect of coolant ejection through slots in the trailing edge of a turbine profile suitable for a small engine. In the considered case, the trailing edge thickness has to be large to accommodate the slot and a wall thickness which is mechanically strong enough on either side of the slot. It was found that the vortex shedding from the airfoil trailing edge has a very great effect on the airfoil efficiency at subsonic speeds, at least for airfoils with a thick trailing edge. The efficiency can be improved by the using of a trailing edge slot of certain characteristics. G.R.

A82-35316 # **The use of performance-monitoring to prevent compressor and turbine blade failures.** R. E. Dundas (Factory Mutual Research Corp., Norwood, MA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-66.* 14 p. Members, $2.00; nonmembers, $4.00.

It is noted that in nearly all cases the cause of complete failure in turbine blades is high-frequency fatigue. The three types of vibration that give rise to alternating loading, namely free vibration, forced vibration, and self-excited vibration (flutter), are discussed. It is recommended that manufacturers design blades in such a way that no critical resonances exist within the operating speed range. It is pointed out that no practical method exists for detecting vibration in a blade. The only way to avoid resonant vibration failures is to avoid conditions that produce abnormal circumferential flow distortion. A regular program of frequent performance analysis of compressors and gas turbines can serve to detect developing flow distortion. Uneven combustion can be detected from temperature differences between exhaust-area thermocouples. It is stressed that the occurrence of fatigue signifies a change in the system that should be corrected. C.R.

A82-35318 # **Improved vane-island diffusers at high swirl.** T. Jiang and T.-T. Yang (Clemson University, Clemson, SC). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-68.* 9 p. 7 refs. Members, $2.00; nonmembers, $4.00.

An experimental study is presented on the performance of vane-island diffusers at high swirl (lambda = 9). Results obtained for four sets of 14 straight vanes are compared with those obtained by Ryan and Yang (1980) for five sets of eight vanes. The 14-vane configuration results in a 40% reduction in pressure loss coefficient below that obtained with the eight-vane configurations, the lowest loss coefficients being obtained where the vane leading edge is at a radius equal to about 1.2 times the diffuser inlet radius. Results are presented in terms of (1) pressure rise versus radial location along the diffuser, (2) diffuser effectiveness versus flow coefficient, and (3) minimum pressure loss coefficient versus flow coefficient. O.C.

A82-35322 # **Test facility and data handling system for the development of axial compressors.** A. C. Reusch and S. Timberley (Ruston Gas Turbines, Ltd., New Products Div., Lincoln, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-73.* 9 p. Members, $2.00; nonmembers, $4.00.

The test installation and the data acquisition system used in the aerothermodynamic development of the axial compressor for a new Ruston 6-MW industrial gas turbine are described. Developments in instrumentation techniques are discussed. Processing of the data is outlined and data are presented for a typical graphical output. The merits of the flexibility achieved, both for the aerothermodynamic test facility and the data acquisition system, are discussed. The potential of the installation for the development of other axial compressors is outlined. (Author)

A82-35323 # **Comprehensive analysis of an axial compressor test with adjustable guide vanes.** C.-L. Chang, C.-H. Kuo, and S.-L. Sha (Marine Boiler and Turbine Research Institute, Harbin, People's Republic of China). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-74.* 7 p. 14 refs. Members, $2.00; nonmembers, $4.00.

Adjustment tests have been successfully conducted on a 12-stage single rotor axial compressor formed by adding two stages to the front of the original 10-stage subsonic compressor. Tests were carried out for five rows of adjustable guide vanes, based on the relationship of setting angle variation to speed. The test results were compared with the case when fixed geometry was used. Under the latter conditions, there existed in the medium speed zone 'dual value characteristics' for which detailed measurements were taken and possible implications discussed. It has been shown that the use of adjustable guide vanes for improving medium and low speed performance is fully justified. C.D.

A82-35327 # **Optimization of compressor vane and bleed settings.** J. E. Garberoglio, J. O. Song, and W. L. Boudreaux (United Technologies Corp., Government Products Div., West Palm Beach, FL). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-81.* 9 p. 16 refs. Members, $2.00; nonmembers, $4.00. Contract No. F33615-79-C-2013.

A comparative evaluation of optimization techniques applied to the optimization of vane and bleed settings in multistage axial compressors is carried out. The main considerations in the evaluation are: the number of test points required to achieve an optimum performance goal, the ability to handle performance and aeromechanical constraints, the sensitivity to measurement errors, and the effect of finite vane travel and bleed flow variations. Descriptions are given of Conmin (a FORTRAN program for constrained minimization) and Copes (a FORTRAN program for engineering synthesis). It is concluded that the Copes/Conmin approximate optimization technique is able to guide the optimization of compressor vane and bleed settings. The approximate optimization approach is shown to work well on problems involving experimental measurements and finite step sizes of the independent variables. C.R.

A82-35329 # **Gas turbine airflow control for optimum heat recovery.** W. I. Rowen and R. L. Van Housen (General Electric Co., Schenectady, NY). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-83.* 9 p. Members, $2.00; nonmembers, $4.00.

Attention is given to the economic gains that can be realized by using the control modes now available to optimize the cycle efficiency at part load operation. Included here are variable inlet guide vane (VIGV) control for single-shaft units, and combined VIGV and variable high pressure set (compressor) speed control for two-shaft units. In addition to the normal control optimization mode for maintaining the maximum exhaust temperature, a new control mode is discussed which permits airflow to be modulated in response to a process signal while at constant part load. This control feature is desirable for gas turbines that supply preheated combustion air to fired process heaters. C.R.

A82-35330 # **Carbon formation by the pyrolysis of gas turbine fuels in preflame regions of gas turbine combustors.** C. D. Hurley (National Gas Turbine Establishment, Farnborough, Hants., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-84.* 7 p. 8 refs. Members, $2.00; nonmembers, $4.00.

A series of experiments is carried out to investigate the formation of carbon from the pyrolysis of gas-turbine fuels, in both the gas and liquid phases, over the temperature range 573-1300 K. Two fuels are examined, a kerosene and a diesel, spanning the range of current and possible future aviation fuels. It is found that only gas-phase pyrolysis can account for the formation of carbon and that there is no difference in the carbon-forming tendencies of kerosene and diesel. The kinetics of the reaction is determined, making it possible to predict the amount of decomposition of the fuels at temperatures up to those typical of the preflame regions of combustors. C.R.

A82-35331 # **Casing treatments on a supersonic diffuser for high pressure ratio centrifugal compressors.** Y. Ribaud (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France) and P. Avram (ONERA, Palaiseau, Essonne, France). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-85.* 9 p. 8 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Direction des Recherches, Etudes et Techniques.

While centrifugal compressors with pressure ratios in the 7-10 range often exhibit slow mass flow margins, such casing treatments as the use of large openings at the diffuser throat which are connected to annular plenums have been found to broaden the reduced mass flow range of the diffuser during supersonic inlet operation. While diffuser flow reduction is associated with a drop in efficiency in the region of reduced mass flow variation, the use of a backswept centrifugal rotor is shown to overcome this efficiency. Attention is given to both the experimental apparatus employed and the mechanical design details of the diffuser equipped with near-throat large apertures. O.C.

A82-35332 # **Liquid particle dynamics and rate of evaporation in the rotating field of centrifugal compressors.** O. Pinkus. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-86.* 10 p. 5 refs. Members, $2.00; nonmembers, $4.00. Contract No. W-7405-eng-26.

Attention is given to an approach in which for an improvement in performance isothermal conditions in centrifugal compressors are achieved in connection with the injection of a coolant from the rotating blades along the path of compression. By full or partial vaporization, the injected liquid would cool the gas, or superheated vapor, and keep it below adiabatic compression temperatures. The particular attraction of such an injection system in centrifugal compressors is that no special equipment is needed for the delivery and compression of the coolant. A study of the process of liquid injection has to take into account the flow of the liquid, aspects of particle dynamics, the rate of vaporization, and two-phase flow. In a study of the injection system, it is found that a large number of orifices with a small diameter should be used. It is desirable to use for the injection liquids of low viscosity. G.R.

A82-35333 # **Two-phase transpiration cooling.** M. A. El-Masri (MIT, Cambridge, MA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-89.* 10 p. 20 refs. Members, $2.00; nonmembers, $4.00.

The history of cooling technologies for gas turbines is briefly considered. It is pointed out that two-phase transpiration cooling offers significant benefits. A major incentive to study two-phase transpiration cooling is the thermodynamic benefit if fuel could be used as the transpiration coolant. The heat transfer problem in a transpired wall is composed of two matched subproblems, including the internal heat transfer between the coolant and the porous wall and the interaction of the transpired stream with the external boundary layer. An analysis of two-phase transpiration cooling is conducted, taking into account a model physical description, governing equations, regimes and modes of operation, and the two-phase range. On the basis of the analysis, two-phase transpiration is identified

Materials and Processes Branch, Washington, DC). In: Reinforced Plastics/Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 17-D). 5 p. Contracts No. N00019-77-C-0250; No. N00019-78-C-0602; No. N00019-80-C-0059.

Metallic coating systems for graphite/epoxy aircraft structures have been developed to provide protection against the strength-degrading effects of moisture penetration, electromagnetic interference (EMI), paint strippers, and lightning strikes. The effectiveness of these coatings in providing protection against impact damage and laser impingement is also being determined. Perforated and solid aluminum-foil coatings, applied by either secondary bonding or cocuring, significantly improve the moisture resistance and electromagnetic shielding of graphite/epoxy laminates. Aluminum-foil coatings also provide protection against the other threats investigated. The substrate corrosion compatibility, machinability, and repairability of selected coatings have been determined. Forming and bonding techniques to fabricate and apply metal-foil preforms to graphite/epoxy hardware are being developed. (Author)

A82-37080 # Evaluation of sensitivity of ultrasonic detection of disbonds in graphite/epoxy to metal joints. S. W. Schramm, I. M. Daniel, and W. G. Hamilton (IIT Research Institute, Chicago, IL). In: Reinforced Plastics/Composites Institute, Annual Conference, 36th, Washington, DC, February 16-20, 1981, Preprints. New York, Society of the Plastics Industry, Inc., 1981 (Session 23-D). 6 p. 16 refs.

A study was conducted to evaluate, improve and optimize ultrasonic techniques for the detection of disbonds in composite laminate to metal joints. Four graphite/epoxy laminates joined to metal plates were investigated using matched pairs of compression and shear wave ultrasonic transducers of three frequencies (1, 2.25, and 5 MHz). Pulse-echo and through transmission modes were used and A-scans, C-scans and frequency spectra were analyzed. It was found that the higher frequency (5 MHz) compression wave transducer operated in the through transmission mode gave the best results in most cases. Shear wave transducers were found to be cumbersome to use and unsuitable for the cases studied. (Author)

A82-37097 # Efficient part removal processes. G. Lubin. In: Reinforced Plastics/Composites Institute, Annual Conference, 37th, Washington, DC, January 11-15, 1982, Preprints. New York, Society of the Plastics Industry, Inc., 1982 (Session 15-E). 8 p.

A study is undertaken to determine possibilities for cost reduction in the removal of plastic airframe components from their molds. A method based on the use of a thin Tedlar or Nylon strip is described which has demonstrated significant cost reductions through tool wear and part removal time improvements in bag-molding processes. The thin plastic strips are used to delineate the outside edge contours of the bag-molded part's layup, and prevent the formation of resin edge flash and excess resin flow. Where the contour of the molded part is too complex, use may be made of two or more wedges at the edge of the part after the layup is completed. The thin strip technique has demonstrated a 73% saving in part removal labor time, or about 30 min. O.C.

A82-37123 A method for observing the deterioration of airframe life in operational conditions (Metodika pro sledovani odcerpavani zivotnosti draku letounu v provoznich podminkach). V. Kahanek. *Zpravodaj VZLU*, no. 6, 1981, p. 273-283. 8 refs. In Czech.

The paper considers the use of an onboard recording device (Parez) to monitor reductions in airframe fatigue life; this device continuously records load factor, aircraft weight, and speed. Attention is given to an algorithm for calculating the extremum values of the load factor, a method for determining stress at critical locations by means of a transfer function, and the analysis of the random process representing this stress by the method of complete cycles. The appropriate S-N curve, mean-load corrections, and fatigue-test results can be used in determining a two-parameter stress distribution, the accumulation of fatigue damage, and the expected life of the aircraft. B.J.

A82-37127 A gust damper (Tlumic poryvu). V. Pokorny. *Zpravodaj VZLU*, no. 1, 1982, p. 15-21. In Czech.

The paper examines a gust damper, i.e., an automatic device which diminishes the effect of gusts on the longitudinal motion of the aircraft by deflecting part of the flaps. The possibility of implementing this type of damper by its inclusion into the autopilot system is considered. Calculations performed for a small passenger aircraft, show that the use of this damper enhances the comfort of the crew and passengers, improves the piloting of the aircraft, and reduces stresses in the structure. B.J.

A82-37220 # A spark ignition model for liquid fuel sprays applied to gas turbine engines. J. E. Peters (Illinois, University, Urbana, IL) and A. M. Mellor (Purdue University, West Lafayette, IN). *Journal of Energy*, vol. 6, July-Aug. 1982, p. 272-274. 14 refs. Army-supported research.

The characteristic time model for ignition is used to describe the spark ignition of liquid fuel sprays in gas turbine combustors. The model states that for ignition to occur, the energy of a spark must heat up an initial volume such that the heat release rate within that volume is greater than the loss rate. Heat generation is limited first by a droplet evaporation time and then a kinetic time; heat loss (for gas turbine applications) is due to turbulent diffusion and, hence, is controlled by a mixing time. Data from two can-type combustors and seventeen fuels are correlated by a single ignition limit curve. The key to applying the model to engine data is the estimation of drop sizes and equivalence ratios at the spark gap. (Author)

A82-37377 Electric field detection and ranging of aircraft. H. Trinks and J. L. ter Haseborg (Hamburg, Hochschule der Bundeswehr, Hamburg, West Germany). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, May 1982, p. 268-274. 7 refs.

The electric field transported by charged aircraft during free flight can be observed quantitatively in distances of up to some 100 m. A system of three plane sensors arranged in the corners of a triangle on the earth's surface is described, by which the flight path of aircraft is detected in the range of 40 to 500 m with velocities of approximately 50 m/s. The theory and typical experimental results are discussed. (Author)

A82-37378 Medium PRF performance analysis. S. A. Hovanessian (Hughes Aircraft Co., Electro-Optical and Data Systems Group, El Segundo, CA). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, May 1982, p. 286-296. 9 refs.

A discussion of various types of x-band airborne radars is presented, together with an account of their development. It is related how, starting with simple, low pulse-repetition frequency (PRF) radars for measuring radar-target range, airborne radar development proceeded with more sophisticated high PRF Doppler radars where radar-target range and range rate were measured simultaneously. The use of Doppler (frequency) in signal processing allowed the separation of moving from nonmoving targets (ground), making possible the detection of moving targets in the presence of ground clutter. It is pointed out that more recent advances in waveform generation and selection have led to the development of medium PRF radars, whereby a greater degree of tactical flexibility in target detection is attained by combining the desirable features of both low and high PRF radars. The systematic evolution of these radars is emphasized, and the necessary theoretical background is given for their performance calculations. C.R.

A82-37380 Instrument failure detection in partially observable systems. J. E. Hertel (NORPAC Engineering, Inc., Seattle, WA) and R. N. Clark (Washington, University, Seattle, WA). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, May 1982, p. 310-317. 11 refs.

Instrument failure detection using the dedicated observer scheme (DOS) depends on partial state observability through each instrument which is monitored. For instrument fault detection by the DOS technique, a quantitative measure of partial state observability is established for each instrument and used to determine a necessary condition on the output structure of the system. This measure, called the internal redundancy of the instrument, indicates the complexity of the logic required for failure detection, and it also indicates where some hardware redundancy can be introduced into the system to improve the fault detection capability of the DOS. The principles developed are applied to a simulation of the pitch axis autopilot of the A7 jet aircraft. (Author)

A82-37381 Implementing aircraft identification schemes by public key cryptosystems. B. Arazi and N. Ekstein (Negev, University, Beersheba, Israel). *IEEE Transactions on Aerospace and Electronic Systems*, vol. 18, May 1982, p. 318-322. 11 refs.

The use of public key cryptosystems for identification purposes has already been suggested. The practical aspects of using such systems for aircraft identification are discussed. It is shown that the digital signature property is not mandatory for implementing an identification procedure. It is then shown how public key distribution systems can be used for identification purposes. The technical difficulties in implementing an identification scheme are finally discussed with possible solutions offered. (Author)

A82-37446 * Formal specification and mechanical verification of SIFT - A fault-tolerant flight control system. P. M. Melliar-Smith and R. L. Schwartz (SRI International, Computer Sciences Laboratory, Menlo Park, CA). *IEEE Transactions on Computers*, vol. C-31, July 1982, p. 616-630. 11 refs. Contract No. NAS1-15428.

The paper describes the methodology being employed to demonstrate rigorously that the SIFT (software-implemented fault-tolerant) computer meets its requirements. The methodology uses a hierarchy of design specifications, expressed in the mathematical domain of multisorted first-order predicate calculus. The most abstract of these, from which almost all details of mechanization have been removed, represents the requirements on the system for reliability and intended functionality. Successive specifications in the hierarchy add design and implementation detail until the PASCAL programs implementing the SIFT executive are reached. A formal proof that a SIFT system in a 'safe' state operates correctly despite the presence of arbitrary faults has been completed all the way from the most abstract specifications to the PASCAL program. B.J.

A82-37466 # On the vortex flow over delta and double-delta wings. H. W. M. Hoeijmakers, W. Vaatstra (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands), and N. G. Verhaagen (Delft, Technische Hogeschool, Delft, Netherlands). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0949.* 13 p. 44 refs. Research supported by the Royal Netherlands Air Force.

An experimental and theoretical investigation is described of the flow above, and downstream of, a 76 deg delta wing and two double-delta wings (sweep 76 deg/60 deg and 76 deg/40 deg, respectively, with kink at 50% chord). The flow pattern is visualized by means of a laser light-sheet technique. For the case of the delta wing, experimental results are compared with numerical results of a free vortex sheet method for computing three-dimensional flow about slender wings, a free vortex sheet method for the limiting case of conical flow, and a computational procedure for computing two-dimensional time-dependent vortex wake roll-up. Based on the laser light-sheet investigation, a vortex-sheet model is proposed for the flow about double-delta wings with leading-edge vortex separation on both wing panels. (Author)

A82-37467 * # Approximate boundary condition procedure for the two-dimensional numerical solution of vortex wakes. R. P. Weston and C. H. Liu (NASA, Langley Research Center, Analytical Methods Branch, Hampton, VA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-0951.* 9 p. 19 refs.

Research on efficient computational methods for general vorticity fields has been conducted in connection with a need for basic research on vortex-dominated flows. The present investigation is concerned with the evolution of vortex wakes behind aircraft wings. An efficient procedure is presented for the calculation of the boundary values used in the numerical solution of the unsteady, incompressible, two-dimensional Navier-Stokes equations for an unbounded flow field. The extent of the computational grid can be reduced compared to methods utilizing standard boundary conditions, without loss of accuracy. The efficiencies realized make it feasible to calculate the vortex wake development for realistic wing configurations, including the merging of multiple vortices, for Reynolds numbers of about 10,000 based on wing chord. G.R.

A82-37477 # A grid interfacing zonal algorithm for three-dimensional transonic flows about aircraft configurations. E. H. Atta and J. Vadyak (Lockheed-Georgia Co., Advanced Flight Sciences Dept., Marietta, GA). *American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Joint Thermophysics, Fluids, Plasma and Heat Transfer Conference, 3rd, St. Louis, MO, June 7-11, 1982, AIAA Paper 82-1017.* 9 p. 9 refs.

An efficient grid interfacing zonal algorithm has been developed for computing the transonic flow field about three-dimensional multicomponent configurations. The algorithm uses the full-potential formulation and the fully-implicit approximate factorization scheme (AF2). The flow field solution is computed using a component adaptive grid approach in which separate grids are employed for the individual components in the multicomponent configuration, where each component grid is optimized for a particular geometry. The component grids are allowed to overlap, and flow field information is transmitted from one grid to another through the overlap region. An overlapped-grid scheme is implemented for a wing and a wing/pylon/nacelle configuration. Numerical results show that the present algorithm is stable, accurate, and can be used effectively to compute the flow field about complex configurations. (Author)

A82-37483 Boeing's new transports in a flight-test marathon. P. Condom. *Interavia*, vol. 37, July 1982, p. 695-697.

Flight testing is proceeding on two totally new aircraft, the Boeing 757 and 767, each with two alternative powerplants and FAA certifications for these aircraft are expected to be received in record time during the second half of 1982. New test facilities and more flight-test engineers have been required to keep the assigned deadlines. Radically updated acquisition and processing facilities for flight-test data also have been introduced utilizing an 'on-line' data-acquisition system, the principal components of which include a new data analysis and monitor system, a gross weight/center of gravity computer, a microwave aircraft positioning system, a data processing ground station, a ground data analysis station and a flight test computing system. A schematic diagram showing the positioning of the components of the data-acquisition system is included. N.B.

A82-37521 The DRAPO system - Materials means and logic functions (La CFAO en mécanique le système DRAPO - Moyens matériels et fonctions logicielles). M. Nouve Eglise (Avions Marcel Dassault-Bréguet Aviation, Vaucresson, Hauts-de-Seine, France). *Revue Française de Mécanique*, 2nd Quarter, 1982, p. 37-43. In French.

Components and functioning of DRAPO (Definition and Realisation of Aircraft by use of a Computer) system are described. The system comprises procedures, materials, and logistics, and interconnection of remote terminals with a centralized data base serving all fields of aerospace production. The system is used by aerospace CAD/CAM personnel in the fabrication of parts for industrial production. A description of the computers forming the central processing units and the remote terminals is provided, noting the links established through telephone lines. Interactive graphics consoles permit remote access to cataloged design shapes after entry of an alphanumeric code. Programming logic, internal to the main system offers design with light pens, electrostatic design, and large surface graphics. Logic functions for the entire system are noted, including methods of changing and rotating the objects in two- and three-dimensions. Finally, flow charts of the computer operations are given. M.S.K.

A82-37528 Traffic flow control in the Frankfurt/Main airport area (Verkehrsflussesteuerung im Anflugbereich Frankfurt/Main). R. Onken (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugführung, Braunschweig, West Germany). *DFVLR-Nachrichten*, June 1982, p. 23-27. In German.

Traffic records at the Frankfurt/Main airport are analyzed in order to determine traffic flow patterns in both the spatial and the temporal dimensions. The effect of various strategies of coordinating traffic flow are assessed. A new computerized traffic planning system concept is explained and evaluated. C.D.

A82-37676 # Investigation of subsonic nacelle performance improvement concept. D. Dusa, D. J. Lahti (General Electric Co., Cincinnati, OH), and D. Berry (Boeing Commercial Airplane Co., Seattle, WA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1042.* 9 p.

Investigations have been conducted with the objective to identify aircraft and nacelle performance improvement concepts aimed at improving the overall aircraft system installed performance. The present study is specifically concerned with exhaust system design technology and impacts on both internal performance and installed drag. A goal of 1% improvement in specific fuel consumption (SFC) and a reduction of 1% in aircraft drag was established. Attention is given to analytical studies, static performance tests, wind tunnel tests, nacelle calibration/thrust-drag bookkeeping, isolated nacelle testing, and installed nacelle testing. G.R.

A82-37677 * # Transonic wind tunnel test of a supersonic nozzle installation. J. A. Yetter (Boeing Military Airplane Co., Seattle, WA), G. B. Evelyn (Boeing Commercial Airplane Co., Seattle, WA), and C. Mercer (NASA, Langley Research Center, Hampton, VA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1045.* 14 p. 8 refs.

The design of the propulsion system installation affects strongly the total drag and overall performance of an aircraft, and the concept, placement, and integration details of the exhaust nozzle are major considerations in the configuration definition. As part of the NASA Supersonic Cruise Research (SCR) program, a wind tunnel test program has been conducted to investigate exhaust nozzle-airframe interactions at transonic speeds. First phase testing is to establish guidelines for follow-on testing. A summary is provided of the results of first phase testing, taking into account the test approach, the effect of nozzle closure on aircraft aerodynamic characteristics, nozzle installation effects and nacelle interference drag, and an analytical study of the effects of nozzle closure on the aircraft. G.R.

A82-37678 * # Kevlar/PMR-15 polyimide matrix composite for a complex shaped DC-9 drag reduction fairing. R. T. Kawai, R. F. McCarthy, M. S. Willer (Douglas Aircraft Co., Long Beach, CA), and F. J. Hrach (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1047.* 9 p. 6 refs.

The Aircraft Energy Efficiency (ACEE) Program was established by NASA to improve the fuel efficiency of commercial transport aircraft and thereby to reduce the amount of fuel consumed by the air transportation industry. One of the final items developed by the program is an improved fairing which is the aft closure for the thrust reverser actuators on the JT8D nacelles on DC-9 aircraft. The reduced-drag fairing uses, in the interest of weight savings, an advanced composite construction. The composite material contains Kevlar 49 fibers in a PMR-15 matrix. Attention is given to the aerodynamic configuration, the material system, and aspects of fabrication development. G.R.

A82-37679 # Development of counter-rotating intershaft support bearing technology for aircraft gas turbine engines. W. L. Gamble (United Technologies Corp., Government Products Div., West Palm Beach, CA) and R. Valori (U.S. Naval Air Propulsion Test Center, Trenton, NJ). *AIAA, SAE, and*

N82-26269# Defense Mapping Agency Hydrographic and Topographic Center. Washington. D C Advanced Technology Div

AN UNBIASED ANALYSIS OF THE DOPPLER COORDINATE SYSTEMS

Muneendra Kumar Feb 1982 25 p refs
(AD-A110510) Avail NTIS HC A02/MF A01 CSCL 08/5

The Doppler system has undergone at least five major revisions, or improvements, in its definition since original inception. Some of the so-called 'minor' modifications of the past have not been well documented and corresponding rigorous updating of the software in many instances is also lacking The actual impact and contribution of each such modification and the absence of proper updating towards inner consistency are not negligible in the present sub-meter era The questions whether (1) the Broadcast Ephemeris (BE) based coordinates are either automatically calculated in the WGS 72 datum or derived with respect to the reference ellipsoid for the WGS 72 datum; (2) the BE system, except for a small bias, is close to the NSWC 9Z-2 system, (3) the BE based coordinates are in the NWL 9D system or 'strictly speaking' in the modified NWL 10D system; (4) the Doppler coordinate system as NWL 9D prior to June 1977 and is NSWC 9Z-2 now, and (5) the coordinate system NWL 9D (and/or NSWC 9Z-2) is geocentric or has a significant Z-axis bias, are still floating around The net result is misunderstanding and misinterpretation for many users The present paper tries to highlight some of the related problems and to answer them as well as possible

GRA

N82-26270# Defense Mapping Agency Hydrographic and Topographic Center. Washington, D C

DATA PROCESSING AT THE GLOBAL POSITIONING SYSTEM MASTER CONTROL STATION

Fran Varnum and James Chaffee 4 Jan 1982 25 p Presented at the 3rd Intern Geodetic Symp on Satellite Doppler Positioning
(AD-A110553) Avail NTIS HC A02/MF A01 CSCL 17/7

At the GPS Master Control Station, range and delta range measurement from remote, unmanned monitor stations are processed to generate satellite navigation messages daily Data are edited, smoothed, and processed in a Kalman filter to generate estimates of ephemerides and all system clock, solar pressure, polar wander, and tropospheric states This processing and some examples of typical performance measures are described

Author (GRA)

N82-26271# Lincoln Lab , Mass Inst of Tech , Lexington

A MODEL FOR SENSOR-INTERCEPTOR TRADE-OFF ANALYSIS

C B Chang 18 Jan 1982 81 p refs
(Contract F19628-80-C-0002)
(AD-A112046 TR-599 ESD-TR-365) Avail NTIS
HC A05/MF A01 CSCL 17/7

In this report we present an analytical model useful for sensor and interceptor trade-off analysis Major factors used in this model include sensor measurement accuracy, data rate, interceptor time delay in responding to a command, and interceptor control error in executing a command Guidance options considered include command guidance and homing guidance whereby the homing sensor accuracy may either be a constant or vary with powers of target range

Author (GRA)

N82-26272# Lincoln Lab Mass Inst of Tech Lexington

APPLICATION OF ADAPTIVE ESTIMATION TO TARGET TRACKING

Chaw-Bing Chang and John A Tabacaynski 13 Jan 1982 63 p refs
(Contract F19628-80-C-0002)
(AD-A112036 TR-598 ESD-TR-81-361) Avail NTIS
HC A04/MF A01 CSCL 17/7

In this report, we present a survey of problems and solutions in the area of target tracking The discussion includes design trade-offs, performance evaluation and current issues

Author (GRA)

N82-26273# Federal Aviation Administration, Atlantic City, N J

COMPARISON BETWEEN THE SURVEILLANCE PERFORMANCES OF THE AIR TRAFFIC CONTROL RADAR BEACON SYSTEM MODE OF THE MODE S AND THE AUTOMATED RADAR TERMINAL SYSTEM Interim Report, Jun. - Sep. 1980

William Swanseen Jan 1982 24 p
(FAA Proj 034-241-510)
(AD-A111733, FAA-CT-81-29, FAA-RD-81-32) Avail NTIS
HC A02/MF A01 CSCL 17/7

A test and evaluation was conducted at the Federal Aviation Administration Technical Center to compare the surveillance performance and the range and azimuth accuracy of the Air Traffic Control Radar Beacon System (ATCRBS) mode of the Mode S (formerly the Discrete Address Beacon System (DABS)) to that achieved with the existing Automated Radar Terminal System (ARTS) III Targets of opportunity and ATCRBS-equipped Technical Center test aircraft were used in this evaluation The 5-foot ATCRBS antenna at the Technical Center Mode S terminal sensor was used to collect data at both the Mode S and the ARTS III sensors Data reduction and analysis tools developed by the Technical Center were used to determine sensor performance characteristics and to highlight areas for further analysis It was concluded that the ATCRBS mode of the Mode S sensor provided improved blip scan ratio. Mode A code, and altitude reliability performance when compared to the ARTS III The Mode S sensor also provided better range and azimuth accuracy than the ARTS III

Author (GRA)

N82-26274# Atmospheric Sciences Lab , White Sands Missile Range, N Mex

THE EFFECT OF IONOSPHERIC VARIABILITY ON THE ACCURACY OF HIGH FREQUENCY POSITION LOCATION Final Report

Melvin G Heaps Aug 1981 46 p refs
(DA Proj 1L1-61102-B-53A)
(AD-A107425 ERADCOM/ASL-TR-0095) Avail NTIS
HC A03/MF A01 CSCL 17/7

The attainable accuracies in high frequency (HF) radio wave position location over ranges of several hundred kilometers are beset with errors of tens of kilometers due to constraints in three major areas ionospheric variability and irregularity; system size limitations for easily fieldable systems, and sufficient data acquisition, processing, and interpretation Of principal concern here is the area of ionospheric variability and irregularity The temporal and spatial coherence of ionospheric structure has been considered with respect to its effect on the accuracy of HF position location The findings show that medium and small-scale ionospheric structures most likely to affect HF position location accuracies have a spatial coherence on the order of 50 km and a temporal coherence on the order of 5 minutes On this basis it is recommended that a multiple ionosonde net be used instead of a single ionosonde, such that an ionospheric sounding point is no more than 50 km from a potential radio wave reflection point, and that soundings be taken on the order of every 5 minutes or less

Author (GRA)

N82-26275# Army Communications-Electronics Engineering Installation Agency, Fort Huachuca, Ariz

STANDARD ENGINEERING INSTALLATION PACKAGE. AIR TRAFFIC RADIO CHANNEL CONTROL EQUIPMENT: CHANGE 1

30 Oct 1981 41 p
(AD-A107150, USACEEIA-SEIP-036-1) Avail: NTIS
HC A03/MF A01 CSCL 17/7

This report contains changes to the Standard Engineering Installation Package (SEIP) which provides information for the engineering and installation of ATRCC (Air Traffic Radio Channel Control) facilities worldwide Information provided consists of site survey data, siting criteria, installation specifications and instructions, certification format Information provided must be adapted to the specific ATRCC facility/location by the project engineer

GRA

N82-26276# Defense Mapping Agency Hydrographic and Topographic Center, Washington, D C

THE WORLDWIDE NAVIGATIONAL WARNING SERVICE

J E Ayers and John P Lyall 1981 14 p
(AD-A107372) Avail NTIS HC A02/MF A01 CSCL 17/2

In the early 1970's both the International Hydrographic Organization (IHO), an intergovernmental agency dedicated to the improvement of nautical charting, and the Intergovernmental Maritime Consultative Organization (IMCO) a U S agency dedicated to safety of life at sea, became concerned over the lack of a coordinated worldwide radio service to keep deep sea mariners aware of hazards to navigation Through their joint efforts the Worldwide Navigational Warning Service (WWNWS) was established, becoming fully operational on 1 April 1980. The WWNWS covers all international shipping routes through a system of 16 NAVAREA Broadcasts, all of which transmit warnings in English (the primary language of the NAVAREA II broadcast is in French) and some of which transmit warnings also in an additional language. This paper describes the development of the initial WWNWS, the mechanism for service improvement and advances which have been made to date, and improvements foreseen for the future. Specific examples from the broadcast experience of the Coordinator for NAVAREA IV and XII and the Northwest Atlantic and Northeast Pacific NAVAREAs, respectively, are given. Author (GRA)

N82-26277* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
ANNULAR WING Patent
Harold J. Walker, inventor (to NASA) Issued 29 Dec. 1981 12 p Filed 30 May 1979 Supersedes N79-24959 (17 - 16, p 2070) Continuation of abandoned US Patent Appl. SN-880725, filed 24 Feb. 1978
(NASA-Case-FRC-11007-2; US-Patent-4,307,856;
US-Patent-Appl-SN-043911; US-Patent-Class-244-12.2;
US-Patent-Class-244-23C; US-Patent-Class-244-34A;
US-Patent-Class-244-93) Avail: US Patent and Trademark Office CSCL 01C

An annular wing particularly suited for use in supporting in flight an aircraft characterized by the absence of directional stabilizing surfaces is described. The wing comprises a rigid annular body of a substantially uniformly symmetrical configuration characterized by an annular positive lifting surface and cord line coincident with the segment of a line radiating along the surface of an inverted truncated cone. A decalage is established for the leading and trailing semicircular portions of the body, relative to instantaneous line of flight, and a dihedral for the laterally opposed semicircular portions of the body, relative to the line of flight. The direction of flight and climb angle or glide slope angle are established by selectively positioning the center of gravity of the wing ahead of the aerodynamic center along the radius coincident with an axis for a selected line of flight.
Official Gazette of the U.S. Patent and Trademark Office

N82-26278*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HINGED STRAKE AIRCRAFT CONTROL SYSTEM Patent Application
Dhanvada M. Rao, inventor (to NASA) (Vigyan Research Associates, Inc.) Filed 11 Jan. 1982 13 p Sponsored by NASA
(NASA-Case-LAR-12860-1; US-Patent-Appl-SN-338387) Avail: NTIS HC A02/MF A01 CSCL 01C

Strakes hinged along the fuselage to avoid violent control degradation in the post-stall flight regime are described. Hinged strakes are deflected from the conventional position coplanar with wings to an anhedral setting to increase controllability at high angles of attack by decreasing projected plan area, and altering vortex flow characteristics. As a result, effective lift on wings can be maintained at higher angles of attack than is possible with conventional strakes. The hinged strakes are retracted flush against the fuselage in high speed cruise flight to avoid drag effects. In an alternate mode of operation, strakes can be asymmetrically deployed to create a rolling that enhances roll control, and a side force that counters aircraft nose-slice and directional divergence. NASA

N82-26279*# Stanford Univ., Calif. Dept. of Aeronautics and Astronautis.
USE OF OPTIMIZATION TO PREDICT THE EFFECT OF SELECTED PARAMETERS ON COMMUTER AIRCRAFT PERFORMANCE Final Report
Valana L. Wells and Richard S. Shevell Jun. 1982 61 p refs
(Grant NAG1-202)
(NASA-CR-169027; NAS 1.26:169027; SUDAAR-534) Avail: NTIS HC A04/MF A01 CSCL 01C

An optimizing computer program determined the turboprop aircraft with lowest direct operating cost for various sets of cruise speed and field length constraints. External variables included wing area, wing aspect ratio and engine sea level static horsepower; tail sizes, climb speed and cruise altitude were varied within the function evaluation program. Direct operating cost was minimized for a 150 n.mi typical mission. Generally, DOC increased with increasing speed and decreasing field length but not by a large amount. Ride roughness, however, increased considerably as speed became higher and field length became shorter. T.M.

N82-26280# Hughes Helicopters, Culver City, Calif.
ADVANCED CONCEPTS FOR COMPOSITE STRUCTURE JOINTS AND ATTACHMENT FITTINGS. VOLUME 2: DESIGN GUIDE Final Report, Jul. 1977 - Feb. 1981
J. V. Alexander and R. H. Messinger Nov. 1981 274 p refs 2 Vol.
(Contract DAAJ02-77-C-0076; DA Proj. 1L2-62209-SH-76)
(AD-A111106; HH-80-402-Vol-2;
USAAVRADCOM-TR-81-D-21B) Avail: NTIS HC A12/MF A01 CSCL 01/3

The purpose of this program was to develop the technology of applying fiber-reinforced composite materials to helicopter joints and attachment fittings that permit disassembly of major components. A generic design methodology approach was used to make the data developed applicable to ongoing and future helicopter programs. A detail design, analysis, and testing program was carried out on the three joint and fitting concepts selected: wrapped tensions fittings, gear box attachment fittings, and seat attachment fittings. The scope of the study included analytical design tools, including finite element computer analysis; fabrication techniques, with special emphasis on weight and cost effectiveness considerations; structural integrity testing, including static, dynamic, failsafe/safe-life, and ballistic tolerance considerations; and nondestructive inspection (NDI) techniques. This volume contains the analytical and experimental results of the laminated angle bracket study and the Design Guide, which covers each type of joint or fitting tested. Author (GRA)

N82-26281# General Accounting Office, Washington, D. C. Mission Analysis and Systems Acquisition Div.
NAVY'S F/A-18 EXPECTED TO BE AN EFFECTIVE PERFORMER BUT PROBLEMS STILL FACE THE PROGRAM Report to Congress
26 Feb. 1982 39 p refs
(AD-A111877; GAO/MASAD-82-20) Avail: NTIS HC A03/MF A01 CSCL 01/3

The F/A-18 naval strike fighter is a multi-mission, carrier-suitable aircraft. This twin-engine aircraft will be used by the Navy and the Marine Corps for fighter and light attack missions such as strike escort, fleet air defense, interdiction, and close air support. The Navy is concentrating on initial training, logistics and support activities as the F/A-18 development program nears completion. All 9 pilot production aircraft have been delivered to the Navy as well as the first 4 of 25 limited production aircraft. Five aircraft were sent to the initial F/A-18 squadron which will begin training F/A-18 pilots and mechanics beginning in July 1982. The first class will be mostly Marine Corps personnel in preparation for the December 1982 initial operation capability, when the first Marine Corps F/A-18 squadron receives its full complement of aircraft. Author (GRA)

N82-26282# Boeing Vertol Co., Philadelphia, Pa.
ADVANCED INTERNAL CARGO SYSTEM CONCEPT DEMONSTRATION AND EVALUATION Final Report, Jan. 1980 - Sep. 1981
C. Ednie Jan. 1982 65 p refs
(Contract DAAK51-80-C-0006; DA Proj. 1L1-62209-AH-76)
(AD-A111990; D210-11848-1; USAAVRADCOM-TR-81-D-37)
Avail: NTIS HC A04/MF A01 CSCL 15/5

This report describes the design and development activity resulting in an 'add-on' cargo handling system for the CH-47 helicopter. Design activity was initiated as a result of cargo handling problems encountered in the European Theater. The Applied Technology Laboratory at Fort Eustis, Virginia, designed and fabricated a mock-up of an internal cargo handling system that demonstrated a practical approach for an add-on system for the CH-47. An evaluation of this mockup, together with the results of an investigative field trip to the European Theater, led to the requirements definition for the cargo handling system. The cargo handling system can be installed in a CH-47 helicopter with no modifications to the primary structure. The system can handle 463L pallets, warehouse pallets and special munitions. The system includes forward and aft barriers to minimize tiedown requirements, ramp extensions to allow easy fork-lift loading and a fuselage levelling system. Functional tests of the system resulted in minor modifications to the original hardware. The modified hardware has been successfully installed and demonstrated in a CH-47C and a CH-47D model helicopter. Author (GRA)

pilot's primary field of view. The functional design criteria that were developed are contained in 'Aircraft Alerting System Design Guidelines.' Report Number DOT/FAA/RD-81/38/11.
Author (GRA)

N82-27237# Federal Aviation Administration, Atlantic City, N.J.
PROCEEDINGS OF THE 1ST ANNUAL WORKSHOP ON AVIATION RELATED ELECTRICITY HAZARDS ASSOCIATED WITH ATMOSPHERIC PHENOMENA AND AIRCRAFT GENERATED INPUTS
Joseph J. Traybar and Nickolus O. Rasch Oct. 1981 38 p Workshop held at Atlantic City, 26-27 Feb. 1980
(FAA Proj. 182-340-100)
(AD-A107326; FAA-CT-81-205) Avail: NTIS
HC A03/MF A01 CSCL 01/3

This workshop was to bring together the various elements of the agency to engage in discussions to identify aviation related electricity hazards associated with both atmospheric phenomena and aircraft generated inputs, and determine a prioritize specific FAA problem area and/or requirements that need to be addressed. This information is vital in the development of the agency's posture and requirements in this important technology area.
Author (GRA)

N82-27238# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
CURRENT ADM RESTRAINT SYSTEM STATUS, TRADE-OFF CONSTRAINTS AND LONG RANGE OBJECTIVES FOR THE MAXIMUM PERFORMANCE EJECTION SYSTEM (MPES)
Marcus Schwartz Feb. 1982 31 p
(AD-A112645; NADC-82021-60) Avail: NTIS
HC A03/MF A01 CSCL 01/2

This report documents the restraint sub-system design options which were investigated for possible incorporation on the Navy Maximum Performance Ejection System (MPES). This study focused mainly on three ongoing development items for the advanced development model (ADM), but also considered some longer range objectives which address future requirements and anticipated technology developments which are necessary for a more comprehensive restraint package.
Author (GRA)

N82-27239# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
AN OXYGEN ENRICHED AIR SYSTEM FOR THE AV-8A HARRIER Final Report
Richard L. Routzahn Oct. 1981 185 p refs
(AD-A112334; NADC-81198-60) Avail: NTIS
HC A09/MF A01 CSCL 06/11

Due to the high support costs, increase in aircraft down time and hazards associated with the utilization of liquid oxygen, development has been progressing with On-Board Oxygen Generation Systems (OBOGS) which have the capability of providing an aviator's breathing gas of sufficient quality and quantity. An Oxygen Enriched Air System (OEAS), employing the molecular sieve concept, has been subjected to environmental test and evaluation by the Naval Air Development Center. The OEAS contains a molecular sieve oxygen concentrator, breathing regulator and performance monitor. The test and evaluation program was conducted to verify that design criteria have been met and to establish system performance in the environments anticipated on the AV-8A Harrier and other tactical aircraft. The system has successfully demonstrated the ability, under certain conditions, to provide a breathing gas composed of 95 percent oxygen and 5 percent argon. It will also provide adequate amounts of breathing gas and sufficient oxygen concentrations for a one or two man open loop breathing schedule. Concentrator anomalies have occurred during the program with control electronics and lubricants within the unit. Redesign of the breathing regulator is necessary to insure compatibility with lox systems and in providing a greater gas quantity during ground idle conditions. Redesign of the performance monitor is necessary to withstand environmental conditions anticipated in service use. Prior to future aircraft incorporation, design studies must pay consideration not only to bleed air pressure availabilities, but also to temperatures which may degrade system performance.
Author (GRA)

N82-27241# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.
PROPOSED RESEARCH TASKS FOR THE REDUCTION OF HUMAN ERROR IN NAVAL AVIATION MISHAPS Final Report, 1 Jul. 1980 - Sep. 1981
Donald M. Layton Oct. 1981 24 p
(AD-A112339; NPS67-81-018) Avail: NTIS
HC A02/MF A01 CSCL 01/2

Seven possible areas of research are proposed that could lead to the reduction and/or mitigation of the human error involvement in Navy aircraft mishaps. These include tasks for the Naval Aerospace Medical Research Laboratory, other Navy and contracted activities. The following research actions have been recommended: Review of existing mishap reports; Cockpit review/analysis of existing Aircraft; Review and revision of standard anthrometrical data; Critical Incident Technique; Design/T&E cooperation procedures; Basic research into error causes; and Broad research functions.
GRA

N82-27242# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
DEVELOPMENT OF A BACKPACK SURVIVAL KIT FOR EJECTION SEATS
Thomas J. Zenobi and Gary F. Whitman 8 Feb. 1982 15 p
(W0584001)
(AD-A113653; NADC-82024-60) Avail: NTIS
HC A02/MF A01 CSCL 06/7

The Navy is designing a Backpack Survival Kit (BSK) for ejection seats. Expected advantages of the BSK as compared to seat lid kits are less weight and more crewmember mobility during emergency egress from aircraft cockpits. With development of more sophisticated ejection propulsion systems, volume for survival kit stowage under the seat lid may not be available; the BSK offers an alternative stowage location. Design considerations include integration into the ejection seat system, attachment to the crewmember's restraint harness, stowage of survival gear, liferaft deployment, and crewmember mobility.
Author (GRA)

N82-27244# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
CABIN SAFETY IN LARGE TRANSPORT AIRCRAFT
9 Sep. 1981 57 p refs
(PB82-129297; NTSB-AAS-81-2) Avail: NTIS
HC A04/MF A01 CSCL 01B

A study by the National Transportation Safety Board showed that in 58.4 percent of the 77 survivable/partially survivable passenger carrying transport aircraft accidents/incidents occurring since 1970, there were failures of cabin furnishings. These failures killed, injured, entrapped or otherwise incapacitated aircraft occupants preventing successful emergency escape in many cases. Failures of cabin furnishings also created obstacles to egress by blocking aisles and exits. Regulations dealing with occupant protection in crashes were last updated 30 years ago. They do not adequately reflect actual crash experience nor do they provide adequate protection to occupants in survivable crashes, especially the more severe crashes, where it is most needed. Recent accident experience supports the need to upgrade the current minimum design standards. Moreover, the technology exists for upgrading existing design and testing methods for cabin furnishings to meet the upgraded regulations.
GRA

N82-27245# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS, INVOLVING CORPORATE/EXECUTIVE AIRCRAFT, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 67 p
(PB82-138967; NTSB-AMM-81-8) Avail: NTIS
HC A04/MF A01 CSCL 01B

Reports of U.S. general aviation corporate/executive aircraft accidents are given. Included are 77 accident briefs, 14 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injuries and causal/factors(s).
GRA

N82-27246# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING MISSING AND MISSING LATER RECOVERED AIRCRAFT, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 72 p
(PB82-138959; NTSB-AMM-81-7) Avail: NTIS
HC A04/MF A01 CSCL 01B

Reports of U.S. general aviation missing and missing later recovered accidents are presented. Included are 68 accident briefs, 21 of which cover missing aircraft not recovered and 47 missing later recovered. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal factor(s). GRA

N82-27247# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING ALCOHOL AS A CAUSE/FACTOR, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 40 p
(PB82-138942; NTSB-AMM-81-6) Avail: NTIS
HC A03/MF A01 CSCL 01B

Reports on all U.S. general aviation accidents involving alcohol impairment as a cause/factor are given. Included are 34 accident briefs, 30 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal factor(s). GRA

N82-27248# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF FATAL ACCIDENTS INVOLVING WEATHER AS A CAUSE/FACTOR, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 271 p
(PB82-138934; NTSB-AMM-81-5) Avail: NTIS
HC A12/MF A01 CSCL 01B

Report of all fatal U.S. general aviation accidents involving weather as a cause/factor for the year 1979 are presented. Included are 276 fatal accidents in the brief format. This format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated on all accidents involving weather as a cause/factor by type of accident, phase of operation, injury index, aircraft damage, pilots certificate, injuries and cause/factor(s). GRA

N82-27249# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING ROTORCRAFT, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 166 p
(PB82-138926; NTSB-AMM-81-4) Avail: NTIS
HC A08/MF A01 CSCL 01B

General aviation rotorcraft accidents are reported. Included are 289 accident briefs, 39 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, kind of flying, pilot certificates, injuries, and causes and related factors. GRA

N82-27250# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING TURBINE POWERED AIRCRAFT, US GENERAL AVIATION, 1979
16 Oct. 1981 110 p refs
(PB82-138918; NTSB-AMM-81-3) Avail: NTIS
HC A06/MF A01 CSCL 01B

General aviation turbine powered aircraft accidents are reported. Included are 171 accident briefs, 36 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) fo each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and cause/factor(s). GRA

N82-27251# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING MIDAIR COLLISIONS: U.S. GENERAL AVIATION, 1979
16 Oct. 1981 54 p
(PB82-138900; NTSB-AMM-81-2) Avail: NTIS
HC A04/MF A01 CSCL 01B

General aviation accidents involving midair collisions are reported. Included are 25 accident files, 14 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by kind of flying, phase of operation, injury index, altitude of occurrence, airport proximity, aircraft damage, pilot certificate, injuries and causal factors(s). GRA

N82-27252# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
LISTING OF AIRCRAFT ACCIDENTS/INCIDENTS BY MAKE AND MODEL, U.S. CIVIL AVIATION, 1979
16 Oct. 1981 188 p
(PB82-138892; NTSB-AMM-81-1) Avail: NTIS
HC A09/MF A01 CSCL 01B

Civil aviation accidents/incidents, sorted by aircraft make and model are reported. Included are the file number, aircraft registration number, date and location of the accident, aircraft make and model and injury index for all 4,182 accidents/incidents occurring in this period. GRA

N82-27253# National Transportation Safety Board, Washington, D. C.
ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA: U.S. AIR CARRIER OPERATIONS, 1979
16 Nov. 1981 87 p
(PB82-134339; NTSB-ARC-81-1) Avail: NTIS
HC A05/MF A01 CSCL 01B

This record of aviation accidents in all operations of the U.S. air carriers for calendar year 1979 includes an analysis by class of carrier and type of service in which the 1979 performances are compared with 5 year base-period averages. A 10 year review, 1970 through 1979, of the certificated route carriers shows accident rates by aircraft make and model, types of accidents, phases of operation, causes or related factors, and a comparison of total which summarize the accidents, fatalities, and accident rates, causal tables; and briefs of accidents are included. GRA

N82-27254# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF FATAL ACCIDENTS INVOLVING FIXED-WING MULTI-ENGINE AIRCRAFT, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 148 p
(PB82-139007; NTSB-AMM-81-12) Avail: NTIS
HC A07/MF A01 CSCL 01B

The publication contains reports of fixed-wing multiengine general aviation aircraft accidents that occurred in 1979. Included are 15 turbojet, 51 turboprop and 444 reciprocating engine aircraft accidents. However, briefs of only the fatal accidents in the three categories are presented. The brief format presents the facts, conditions, circumstances and probable cause(s) for each accident. Additional statistical informatin is tabulated by injuries and cause(s) and related factor(s). GRA

N82-27255# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING COMPUTER AIR CARRIERS AND ON-DEMAND AIR TAXI OPERATIONS, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 168 p
(PB82-138991; NTSB-AMM-81-11) Avail: NTIS
HC A08/MF A01 CSCL 01B

Reports of commuter air carrier and on-demand air taxi accidents are presented. Included are 50 commuter air carrier and 173 on-demand air taxi accident briefs. The brief format presents the facts, conditions, circumstances and probable cause(s) for each accident. Additional statistical information is tabulated by type of operation, injuries, aircraft weight, and cause(s) and related factor(s). GRA

N82-27256# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING AERIAL APPLICATION OPERATIONS, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 260 p
(PB82-138983; NTSB-AMM-81-10) Avail: NTIS
HC A12/MF A01 CSCL 01B

Reports of U.S. general aviation aeriel application accidents occurring in 1979 are given. Included are 395 accident briefs, 27 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additonal statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries, kind of operation and causes/factors. GRA

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as a potentially-powerful cooling scheme for gas turbines. Moderate blade temperatures may be maintained in very high temperature gas streams without separating the boundary layer or incurring large aerodynamic or cooling penalties. G.R.

A82-35335 # The effect of inlet distortion on the performance characteristics of a centrifugal compressor. I. Ariga, S. Masuda (Keio University, Yokohama, Japan), Y. Watanabe (Japan Air Lines, Overhaul Center, Tokyo, Japan), I. Watanabe (Kanto Gakuin University, Yokohama, Japan), and N. Kasai. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-92.* 9 p. 9 refs. Members, $2.00; nonmembers, $4.00.

The effects of inlet pressure distortion on the performance characteristics and surge margin of a centrifugal compressor have been investigated experimentally using a low-speed compressor test rig with the inlet honeycomb acting as the distortion generator. Results indicate that inlet distortion has a negative effect on the efficiency and surge margin of the compressor, with radial distortion having a much stronger effect than circumferential distortion. Various distortion indices are examined in order to correlate the compressor performance to inlet distortion, and a distortion index related to the shock loss of the inducer is shown to be a suitable parameter for estimating the total pressure ratio in the case of inlet distortions. V.L.

A82-35336 # A two-dimensional boundary-layer program for turbine airfoil heat transfer calculation. R. M. C. So (Arizona State University, Tempe, AZ), I. H. Edelfelt, D. M. Kercher (General Electric Co., Schenectady, NY), and E. Elovic (General Electric Co., Aircraft Engine Group, Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-93.* 8 p. 23 refs. Members, $2.00; nonmembers, $4.00. Contract No. DE-AC01-76-ET-10340.

Modern gas turbines operate at turbine inlet gas temperature levels which are substantially above the structural capability of the high-temperature alloys used in gas turbine components. It is, therefore, necessary to cool these components. The design of suitable cooling procedures is currently a complex, expensive process, involving the adjustment of calculated values by empirical test factors. The development of a heat transfer calculation procedure could, in this connection, lead to faster and much more economical procedures for the design of suitable cooling processes. The two-dimensional boundary-layer program STAN5 reported by Crawford and Kays (1976) is used as a basis for the development of a program which can be used with confidence by heat transfer design engineers to calculate the heat transfer on turbine airfoil surfaces. G.R.

A82-35337 # Development of hybrid gas turbine bucket technology. L. G. Peterson, D. E. Hrencecin, W. F. Schilling, and W. J. Ostergren (General Electric Co., Gas Turbine Div., Schenectady, NY). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-94.* 10 p. Members, $2.00; nonmembers, $4.00. Contract No. DE-AC01-80ET-17005.

A program has been initiated to evaluate the feasibility of producing a composite large-scale industrial gas turbine bucket using different nickel base superalloys in the airfoil and dovetail sections. Preliminary studies involve microstructure and high temperature tensile test evaluation of three directionally solidified alloys and two powder metal alloys. DS nickel base alloys include MAR-M200 plus Hf, René 80H and 441 (modified René 150) while the powder metals are low carbon versions of Astroloy (AP1) and PA-101. Hot isostatic pressing has been used to diffusion bond DS and powder alloys together. Powder densification and bonding take place simultaneously. Three separate solution temperatures have been used to HIP diffusion and bond each DS/powder alloy combination. Subsequent heat-treating to simulate a coating cycle and aging are being evaluated. Metallurgical evaluation as well as high temperature tensile testing have been used to assess bondline cleanliness and mechanical integrity. (Author)

A82-35338 # Net shape components for small gas turbine engines. W. P. Schimmel and G. J. Quill (Williams International, Walled Lake, MI). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-96.* 9 p. Members, $2.00; nonmembers, $4.00.

Advanced manufacturing methods producing net shape components for both current and next-generation high performance gas turbine engines are described. A coordinated development program is being conducted to provide near-net shape components which will minimize machining costs, save critical materials, and in some cases improve component performance. The techniques used include the isothermal forging of titanium, titanium casting, hot isostatic pressing of titanium powder, diffusion-bonded dual property techniques, and a diffuser case fabrication process. Emphasis is placed on the unique demands of small gas turbine engines. O.C.

A82-35339 # Design and investigations of a three dimensionally twisted diffuser for centrifugal compressors. M. Jansen and M. Rautenberg (Hannover, Universität, Hanover, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-102.* 9 p. 8 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Forschungsvereinigung Verbrennungskraftmaschinen; Deutsche Forschungsgemeinschaft *Contract No. SFB-61.*

A vaned diffuser has been designed for a 90 deg centrifugal compressor impeller having a highly distorted exit flow distribution, where the maximum flow angle difference across the diffuser width at the entrance is 29 deg. The vane inlet angle is matched to this flow angle distribution by imparting a three-dimensional twist to the diffuser vanes. Mappings of total pressure ratio and efficiency against mass flow for the cases of a twisted diffuser compressor and a compressor using a conventional, cambered vane and straight channel diffuser are compared. Twisted diffuser performance is discussed in light of detailed flow field measurements both before and behind the diffuser, as well as the static pressure distribution along the diffuser. O.C.

A82-35340 # Influence of casing treatment on the operating range of axial compressors. J. Paulon (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France) and D. Dehondt (Turboméca, S.A., Bordes, Pyrénées-Atlantiques, France). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-103.* 9 p. 9 refs. Members, $2.00; nonmembers, $4.00.

A theoretical study has been conducted in order to clarify the effect of casing treatment by cutting circular grooves on the performance of axial flow compressors. Rules for determining the groove depths have been established which account for the surge margin improvement obtained in some cases and make it possible to dismiss inefficient geometric configurations. Such parameters as groove length and position do not seem to be critical; however, optimum results are obtained when the treated length is smaller than the chord projection on the axis, and the groove is centered on that chord or slightly shifted upstream. V.L.

A82-35342 # The effect of NaCl/g/ in high temperature oxidation. J. G. Smeggil and N. S. Bornstein (United Technologies Research Center, East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-106.* 5 p. 6 refs. Members, $2.00; nonmembers, $4.00.

Experiments have been carried out to investigate the effect of gaseous NaCl on the oxidation of materials used in gas turbines. The materials investigated included NiAl, Mar M-509, NX-188, Ni-10Mo, Ni-25Cr, Ni-40Cr, and Ni-40Cr-5Si. It is found that very low levels of gaseous NaCl (0.1-100 ppm) approaching those expected for some marine and industrial turbine applications are sufficient to markedly increase the oxidation rate of turbine alloys and coatings, with the magnitude of the effect related to the alloy substrate chemistry. Alloys rich in molybdenum appear to be most susceptible to this form of corrosion. V.L.

A82-35344 # Effect of the rear stage casing treatment on the overall performance of a multistage axial-flow compressor. Y.-L. Gao (Shenyang Aeroengine Co., Shenyang, People's Republic of China) and K.-M. Li (Shenyang Aeroengine Research Institute, Shenyang, People's Republic of China). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-110.* 5 p. 10 refs. Members, $2.00; nonmembers, $4.00.

The effect on high speed stall margin and efficiency of tip treatment at the rear stages of a compressor is discussed. A nine-stage engine compressor was tested in a rig with and without casing treatment on the tip sections of the last three rotors, and another series of tests was conducted on a modified compressor with twisted rotor blades in the rear stages. The results showed that the casing treatment of rear stages in a multistage axial-flow compressor could effectively improve the surge margin of the compressor at high speeds. The casing treatment had almost no effect on the efficiency of the compressor with blades untwisted, while at the inlet stage it mainly improved the distortion tolerance and the performance of the compressor at low and medium speeds. C.D.

A82-35345 # On the performance prediction of a centrifugal compressor scaled up. T. Mashimo (Meiji University, Kawasaki, Japan), I. Ariga (Keio University, Yokohama, Japan), T. Sakai (Tokyo Science University, Tokyo, Japan), and I. Watanabe (Kanto Gakuin University, Yokohama, Japan). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-112.* 9 p. 18 refs. Members, $2.00; nonmembers, $4.00. Research sponsored by the Dengyosha Machine Works, Ehara Manufacturing Co., Fuji Electric Co., Hitachi, Ltd., Hitachi Shipbuilding and Engineering Co., et al.

A centrifugal compressor performance prediction method, in which each loss generated within the compressor stage is estimated by recognizing the individual relationship between it and the velocity distribution, the Reynolds number, and the Mach number, was investigated over a wide range of sizes and types. Three compressors having impellers of 154, 112, and 78 mm diameters were employed in the test, and the results were analyzed to obtain calculation formulas for the losses. By referring to unpublished test data, it was confirmed that the formulas could be applied to predict the performance levels of larger compressors with impellers up to 640 mm. From the results, it could be deduced that (1) the wall friction losses and the secondary flow losses within the compressor decreased with increase of impeller size, and (2) the leakage flow losses increased when scaling up the compressor, even when tip clearance or blade height were held constant. C.D.

A82-35346 # Cryogenic turbine testing. R. J. Iannuzzelli and R. E. Filippi (Air Products and Chemicals, Inc., Allentown, PA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-113.* 9 p. 8 refs. Members, $2.00; nonmembers, $4.00.

Problems encountered in data acquisition during turbine machinery testing in a cryogenic environment are discussed with reference to measurement and sensing errors, overall data uncertainty and its implications, and surface roughness effects on wheel losses. It is shown that data quality can be insured by using the power balance as an indicator of data uncertainty. Data uncertainty due to heat transfer effects can be minimized by adequately insulating the test vehicle. The measurement of temperature downstream of a turbine wheel should be made after a flow-mixing device to avoid adverse temperature distributions which could lead to sensing errors. And, finally, computerization of the data acquisition function can significantly reduce data uncertainty. V.L.

A82-35348 * # A computational design method for transonic turbomachinery cascades. H. Sobieczky (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für theoretische Strömunsgmechanik, Göttingen, West Germany) and D. S. Dulikravich (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-117.* 10 p. 17 refs. Members, $2.00; nonmembers, $4.00.

This paper describes a systematical computational procedure to find configuration changes necessary to modify the resulting flow past turbomachinery cascades, channels and nozzles, to be shock-free at prescribed transonic operating conditions. The method is based on a finite area transonic analysis technique and the fictitious gas approach. This design scheme has two major areas of application. First, it can be used for design of supercritical cascades, with applications mainly in compressor blade design. Second, it provides subsonic inlet shapes including sonic surfaces with suitable initial data for the design of supersonic (accelerated) exits, like nozzles and turbine cascade shapes. This fast, accurate and economical method with a proven potential for applications to three-dimensional flows is illustrated by some design examples. (Author)

A82-35350 # A critical appraisal of some current incidence loss models for the stator and rotor of a mixed flow gas turbine. F. Fairbanks (Hatfield Polytechnic, Hatfield, Herts., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-120.* 6 p. 5 refs. Members, $2.00; nonmembers, $4.00.

Current models predicting the loss due to incidence in radial turbomachinery are briefly reviewed, and a new incidence loss model, designated the shock loss model, is proposed. As with the other models, the shock loss model assumes a change in the tangential components of the kinetic energy at entry but thereafter uses only fundamental principles, obviating the difficulty of changing the definition of the loss according to the flow conditions. Analysis is carried out for the stator blades of a radial turbine, and it is found that the shock loss model, as derived, overestimates by approximately 80% the overall loss parameter for the stator passage. It is concluded that none of the loss models reviewed, including the shock loss model, is satisfactory since they do not account for flow pattern in the rotor or stator passages. V.L.

A82-35351 # A mixed-flow cascade passage design procedure based on a power series expansion. R. A. Novak and G. Haymann-Haber. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-121.* 15 p. 10 refs. Members, $2.00; nonmembers, $4.00.

A blade-to-blade design technique is presented which will quickly develop the unique blade shape implied by the meridional-plane input specifications, which could then be treated as a preliminary version of a final blade shape, to be modified in accordance with the designer's perception of neglected real flow effects. The flow is assumed to be steady, two-dimensional on surfaces of revolution, nonviscous, and nonrotational. The process readily gives solutions for subsonic, supersonic, or mixed-flow conditions. The solutions are channel solutions, and realistic only in situations where a shock-free flow is possible. Particularly for supersonic compressor cascades, the results must be treated with caution. Numerous examples are given, with comparisons with experimental data and other analytic solutions. C.D.

A82-35352 # Development and application of a performance prediction method for straight rectangular diffuser. F. S. Bhinder and M. H. Al-Modafar (Hatfield Polytechnic, Hatfield, Herts., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-122.* 5 p. 7 refs. Members, $2.00; nonmembers, $4.00. Research supported by Rolls-Royce, Ltd.

A brief description of a step-by-step method for predicting the performance of straight rectangular diffuser is given. The theory has been used to predict the performance of rectangular diffusers for which comprehensive experimental data are available and the agreement between experimental and predicted results is very close. The method is shown to be applicable over a wide range of inlet Mach numbers, aspect ratios, and Reynolds numbers. When the diffuser divergence angle is less than 8 deg, the static pressure recovery coefficient is only slightly dependent on the aspect ratio, provided the latter is greater than one. However, for diffuser divergence angle greater than 12, the optimum entry aspect ratio is around unity. The inlet blockage has a significant influence on the pressure recovery for all geometrical configurations, entry Mach numbers, and entry Reynolds numbers. C.D.

A82-35353 # Performance analysis of the test results on a two-stage transonic fan. C. Baoshi and Z. Tianyi (Shenyang Aeroengine Research Institute, Shenyang, People's Republic of China). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-123.* 5 p. Members, $2.00; nonmembers, $4.00.

Test results obtained from a two-stage fan are analyzed and the reasons for failure to attain the design performance target are presented. It was found that the design airflow and pressure ratio of the fan were attained, but the efficiency and stall margin were far lower than the design values. The problems found in stage one were that the design performance parameters selected on the basis of the original tests were too high, that the partspan shroud added onto the rotor degraded the performance and completely changed the spanwise flow field, and that the modifications on the flowpath and chord length of the stator caused an excessively high inlet Mach number at the stator hub, resulting in high losses and flow separation there. The high load and high incidence at the hub of the second rotor caused higher losses and reduced the stall margin of the fan, and the stages were inadequately matched. C.D.

A82-35358 # Accuracy expectations for gas turbine and centrifugal compressor performance testing. T. C. Heard and E. J. Hipp (General Electric Co., Schenectady, NY). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-128.* 13 p. 13 refs. Members, $2.00; nonmembers, $4.00.

A simple procedure for estimating instrument errors and for assessing their influences on the final results is outlined. The procedure uses the statistical approach of first estimating the uncertainty of each measurement or piece of data to be used, and then combining their effects in prescribed ways to estimate the uncertainties of performance functions. Probable error uncertainty is defined as a band of such width that there is a 50 percent chance of including the true value. As an example, the p/e uncertainties are estimated for testing a gas turbine driven compressor operating at 25,000 horsepower and at a relatively low pressure ratio on natural gas. Uncertainties are found for the compressor shaft power, the gas turbine shaft power, the gas turbine heat rate, and the gas turbine and compressor considered as a single package. C.D.

A82-35362 # The potential impact of future fuels on small gas turbine engines. J. A. Saintsbury (Pratt and Whitney Aircraft of Canada, Ltd., Longueuil, Quebec, Canada) and P. Sampath. *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-133.* 8 p. 11 refs. Members, $2.00; nonmembers, $4.00.

The present investigation is based on the assumption that in the not too distant future aviation gas turbine fuels as they are known today will not be available and that it will be necessary to accept either degraded fuels or fuels derived from sources presently considered unconventional. The investigation addresses gas turbine fuels in general and their effect on combustion systems, giving particular attention to small gas turbine engine combustion systems. It is found that the impact of future fuels on aircraft gas turbine engines will vary depending on engine size and type, because of differences in fundamental design criteria, and constraints of weight, cost, and size. As a first step towards fuel conservation pending availability of viable alternate energy sources, broadened specification fuels with modest relaxations in aromatics, and freeze point will likely be in use in the near term, but fuels from alternate sources will be longer term because of the need to develop an appropriate production industry. G.R.

A82-35363 An inviscid-viscous interaction treatment to predict the blade-to-blade performance of axial compressors with leading edge normal shock waves. W. J. Calvert (National Gas Turbine Establishment, Farnborough, Hants., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-135.* 12 p. 23 refs. Members, $2.00; nonmembers, $4.00.

An inviscid-viscous interaction treatment has been developed to predict the blade-to-blade flow in axial compressors operating with supersonic inlet condi-

ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1054. 9 p.

Analytical studies on intershaft cylindrical roller bearings for advanced gas turbine engines configured with counter-rotating shafts showed advantages in fatigue life and internal radial clearance control when the outer ring was mounted on the low speed rotor and the inner ring on the high speed rotor. Parametric rig tests on eight bearings showed that the primary drivers on roller end wear were roller-to-guide flange end clearance, outer race preload and internal radial clearance. Test results showed concentric roller end wear patterns on all test bearings and varying levels of wear. The performance data was used to improve prediction techniques for bearing heat generation and temperatures. (Author)

A82-37682 # Evaluation of a multivariable control design on a variable cycle engine simulation. S. J. Przybylko (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH)and S. M. Rock (Systems Control Technology, Inc., Palo Alto, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1077.* 8 p. 13 refs. Contract No. F33615-77-C-2096.

It is pointed out that aircraft turbine engine propulsion control systems have been the focus of extensive development in recent years. Future engine cycles have been defined and include a significant variable geometry capability to the extent that the thermodynamic engine cycle varies over wide limits. The number of actuated variables was expanded, and resulting control strategies require extension of the current advanced multivariable control methodologies. The present investigation is concerned with the evaluation of a multivariable control designed for the JTDE GE 23 variable cycle engine. Attention is given to a description of the Joint Technology Demonstrator Engine (JTDE), the control requirements, a control structure overview, and the computer simulation and evaluation procedure. G.R.

A82-37683 * # Flight evaluation of a digital electronic engine control system in an F-15 airplane. L. P. Myers, K. G. Mackall, F. W. Burcham, Jr. (NASA, Ames Research Center, Edwards AFB, CA), and W. A. Walter (United Technologies Corp., Pratt and Whitney Aircraft Group, West Palm Beach, FL). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1080.* 14 p. 6 refs.

Benefits provided by a full-authority digital engine control are related to improvements in engine efficiency, performance, and operations. An additional benefit is the capability of detecting and accommodating failures in real time and providing engine-health diagnostics. The digital electronic engine control (DEEC), is a full-authority digital engine control developed for the F100-PW-100 turbofan engine. The DEEC has been flight tested on an F-15 aircraft. The flight tests had the objective to evaluate the DEEC hardware and software over the F-15 flight envelope. A description is presented of the results of the flight tests, which consisted of nonaugmented and augmented throttle transients, airstarts, and backup control operations. The aircraft, engine, DEEC system, and data acquisition and reduction system are discussed. G.R.

A82-37685 # Prediction of cruise missile inlet peak instantaneous distortion patterns from steady state and turbulence data using a statistical technique. J. A. Forner and J. M. Manter (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1085.* 10 p. 7 refs.

The commonly accepted method of assessing inlet engine compatibility is to evaluate the engine capability to operate stall-free with the peak instantaneous distortion levels delivered by the inlet. The development of inlet systems for aircraft and missiles requires, therefore, an assessment of peak instantaneous distortion. The present investigation is concerned with a statistical procedure for predicting instantaneous peak distortion patterns, taking into account an approach based on a method considered by Stevens et al. (1980). The investigation has the objective to expand the data base supporting the method by comparing predicted distortion values to analog screened values for three cruise missile inlets. G.R.

A82-37688 # Electronic control for small engines. W. H. Hermann, J. A. Weber, and E. E. Ervin (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, IN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1126.* 8 p.

A description is presented of an electronic system for the control of the small engines of the Model 250 series, which are used in many helicopter applications (single and twin) and in selected turboprop applications. The requirements for developing the Model 250 electronic control concept are examined. The electronic control is active throughout the engine operating regime. The principal features of the electronic control system are related to start temperature limiting, altitude-compensated surge avoidance, rotor speed governor, loss-of-load protection, backup analog governor, backup loss-of-load protection, manual backup, and diagnostics and readout. The principal components of the Model 250 electronic fuel control system are shown in a graph. A digital control unit is a new component which is currently being developed for this system. G.R.

A82-37689 # Reliability design study for a fault-tolerant electronic engine control. D. E. Warner and W. H. Hermann (General Motors Corp., Detroit Diesel Allison Div., Indianapolis, IN). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1129.* 8 p.

The Advanced Turbine Engine Study (ATES) has the objective to define the engines which are to power the advanced aircraft of the late 1980's. Digital electronic controls are required for the operation of advanced variable cycle engines for high performance aircraft. Problems of failure tolerance and reliability arising in connection with the control system were investigated in a study on Full-Authority, Fault-Tolerant Electronic Engine Controls (FAFTEEC). A description is presented of the highlights and the significant results of the study. Attention is given to the baseline system which was defined to meet mission, aircraft, and engine requirements derived from the ATES program. The module database is considered along with alternate fault-tolerant system designs, specific design tools utilized in the design of fault-tolerant systems, and aspects of system evaluation. G.R.

A82-37690 # Design concepts of an advanced propulsion monitoring system. A. R. Mulukutla and V. W. Lawson (General Electric Co., Cincinnati, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1130.* 5 p. Contract No. F33615-79-C-2092.

A number of tests of engine health monitoring systems have demonstrated the feasibility of acquiring and recording some of the engine health related data. An American aerospace company is developing an Advanced Propulsion Monitoring System (APMS) to remedy some of the shortcomings of previous systems with regard to automatic analysis and presentation of data in useful form. After the conduction of tests of the APMS in the laboratory, some of the hardware and software are being modified for a demonstration test on a different engine with a different operating cycle. A description is presented of some of the details of the demonstration configuration. Attention is given to the demonstration test objectives, a system overview, and a software overview. G.R.

A82-37691 * # Optical tip clearance sensor for aircraft engine controls. G. L. Poppel (General Electric Co., Aircraft Engine Business Group, Cincinnati, OH), D. T. F. Marple (General Electric Co., Schenectady, NY), and R. J. Baumbick (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1131.* 9 p. Contract No. NAS3-21843.

Aircraft gas turbine performance and efficiency are related to airfoil tip clearance. The possibility has been considered to obtain optimum performance and efficiency by reducing clearance to a safe minimum with the aid of a closed-loop tip clearance control system, which utilizes a tip clearance sensor. The use of optical sensing methods appears to represent a potential solution to the tip clearance measurement problem. Principles of sensor operation are discussed along with dimensional considerations and diffraction limitations. A description is presented of the study of the feasibility of a certain sensor, taking into account the test rig system, the optical components, and the mounting tube. Attention is also given to the operation of the feasibility-study sensor, performance estimations, the optical fiber bundle, light beam refraction, and aspects of aircraft engine implementation. G.R.

A82-37692 # Advanced exhaust nozzle concepts using spanwise blowing for aerodynamic lift enhancement. J. G. Doonan and W. H. Davis, Jr. (Grumman Aerospace Corp., Bethpage, NY). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1132.* 16 p. 8 refs. Contracts No. F33615-79-C-3009; No. F33615-77-C-3045.

Underwing and wing trailing edge flap spanwise blowing configurations employing a secondary nozzle were tested in a wind tunnel investigation in order to assess their STOL performance enhancement effects, for the case of a 1990s-technology twin-engined fighter with close-coupled canard planform. The two spanwise blowing concepts were incorporated in a two-dimensional, thrust vectoring and convergent-divergent flow geometry primary exhaust nozzle. The advantages of spanwise blowing are identified through an analysis of wind tunnel 1/8-scale model aircraft force and surface pressure data. The underwing and trailing edge methods have demonstrated induced lift coefficients equal to 33% and 28% of the unpowered aerodynamic lift coefficient, respectively. Consideration is also given to lift augmentation by means of the primary thrust-vectoring nozzles. O.C.

A82-37693 # Thrust reverser induced flow interference on tactical aircraft stability and control. C. Chiarelli, D. Lorincz, and B. Hunt (Northrop Corp., Aircraft Div., Hawthorne, CA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1133.* 11 p. 6 refs.

It is pointed out that the vulnerability of runways to bomb damage is a major threat to the operational effectiveness of tactical aircraft. Future designs will, therefore, very likely be required to operate from short undamaged portions of runway. The most critical problem in achieving STOL is to reduce landing distance because conventional tactical aircraft require landing lengths which are several times greater than their takeoff lengths. An approach involving the use of a thrust reverser represents a possible solution to the problem. Attention is given to a study of reverser jet/tunnel wall interference conducted in a low speed wind tunnel, results for a thrust reversing version of the F/A-18A aircraft, and wind tunnel data for reverser effects on the stability and control characteristics of an advanced fighter configuration. G.R.

A82-37694 # Advanced nozzle integration for air combat fighter application. H. W. Wallace (McDonnell Aircraft Co., St. Louis, MO) and D. L. Bowers (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1135.* 13 p.

Analytical and experimental investigations have been conducted in an Advanced Nozzle Concepts program, with a view to establishing design guidelines for future tactical fighters. The configurations studied include high and low aspect ratio two-dimensional nozzles, as well as advanced axisymmetric nozzle, installed in air-to-air and air-to-surface primary mission tactical aircraft of generically different design. Attention is given to the air-to-air vehicle, for which nozzle configurations were wind tunnel tested at speeds from Mach 0.6 to 1.5 in order to determine relative installation drag and aerodynamic interaction effects due to thrust vectoring and reversing. It is shown that thrust reversal for STOL operation and thrust vectoring for trim enhancement at high lift coefficients may be achieved with a small penalty in takeoff gross weight. O.C.

A82-37695 # Experimental performance evaluation of 'ventilated mixers' - A new mixer concept for high bypass turbofan engines. J. S. Sokhey (Boeing Commercial Airplane Co., Seattle, WA). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1136.* 13 p. 7 refs.

An experimental investigation of two Ventilated Mixer cold/hot dual flow nozzle models is presented in which total axial thrust, mixer surface static pressures are measured, and rake surveys are taken of total pressure and temperature taken at the charging station, mixing plane, and nozzle exit plane. Greater accuracy than that normally obtainable was achieved in the definition of nozzle model surfaces through the numerically controlled fabrication of each unit from a single stainless steel block. Ventilation slots were machined through the mixer lobe walls in order to improve mixer performance through boundary layer energization, which inhibits primary flow separation. Analysis of the test results shows the ventilation concept to yield a significant reduction in total mixer pressure loss, with additional improvements noted in mixing effectiveness and jet noise reduction. Ventilated mixer flow characteristics are compared with those of unventilated mixers, and the consequence of this nozzle design's applications to existing turbofan engines is discussed. O.C.

A82-37698 # A cost modeling approach to engine optimization. D. G. Culy and R. C. Gunness (Garrett Turbine Engine Co., Phoenix, AZ). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1185.* 8 p. Navy-USAF-sponsored research.

An outline is provided of an engine optimization study carried out as part of the Navy Advanced Technology Engine Study (ATES) Program. The objective of the study was to determine a set of engine cycle parameters, and then to establish a set of component technologies and a development strategy which would result in the lowest peacetime Life Cycle Cost (LCC) for six different aircraft fleets. For simplicity, one tactical system (using an engine in the middle of the study size range) is discussed. Preliminary sizing was based on conventional optimization criteria. The LCC model used is briefly described, and the scenario for the mission is given. The study results are shown in terms of both LCC and aircraft takeoff gross weight. G.R.

A82-37709 # Models for a turbulent premixed dump combustor. N. Darabiha, S. M. Candel (Ecole Centrale des Arts et Manufactures, Châtenay-Malabry; ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France), and E. Esposito (Ecole Centrale des Arts et Manufactures, Châtenay-Malabry, Hauts-de-Seine, France). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1261.* 9 p. 23 refs. Research supported by the Société Nationale d'Etude et de Construction de Moteurs d'Aviation.

The modeling of the process of ignition and flame spreading in a premixed dump combustor is discussed. The treatment, which is essentially numerical, relies on a time-split finite difference method. Mass-averaged conservation equations are used in order to represent the flow dynamics. A simple chemically reacting system is assumed, and combustion is simulated using two models. The reaction rate is kinetically controlled in the first model. The second model is based on the coherent flame concept of Marble and Broadwell (1977). Time-dependent flame spreading calculations are described in some detail. C.R.

A82-37710 * # Turbulence measurements in a confined jet using a six-orientation hot-wire probe technique. S. I. Janjua, D. K. McLaughlin (Dynamics Technology, Inc., Torrance, CA), D. G. Lilley (Oklahoma State University, Stillwater, OK), and T. Jackson. *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1262.* 18 p. 21 refs. Contract No. NAG3-74.

The six-orientation hot-wire technique is applied to nonreacting axisymmetric flowfields, obtaining measurements of time-mean and rms voltages at six different orientations, thus providing enough information to determine the time-mean velocities, turbulence intensities, and shear stresses. At each location in the flow, there are six different values of each of the above quantities that can be obtained using six sets of measurements of three adjacent orientations. Flowfield surveys of both swirling and nonswirling confined jets are used to calculate estimates of the mean velocity components and the normal and shear turbulent stresses, and comparisons with independent data are made. A sensitivity analysis of the data reduction technique demonstrates that the largest uncertainties are to be expected in the turbulent shear force estimates. C.D.

A82-37712 # Current techniques for jet engine test cell modeling. R. J. Freuler (Ohio State University, Columbus, OH) and R. A. Dickman (General Electric Co., Aircraft Engine Group, Cincinnati, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1272.* 16 p.

A model test program to demonstrate acceptable aerodynamic performance for a jet engine test cell with a 26 ft by 26 ft cross section is described. Utilizing a 1/17.6 scale plexiglass model of the full-scale jet engine test cell and a modified turbine powered simulator, a technique is developed in conjunction with an online data acquisition system (outlined in a block diagram) by which a maximum amount of test information can be acquired, processed, and presented to the jet cell model test engineer in a manner responsive enough to permit the 'immediate' analysis of a test point. A matrix of inlet/cell/exhaust geometries is model tested to demonstrate their interaction on the test cell system aerodynamics. This model test demonstrates acceptable test cell aerodynamics for a 26 ft by 26 ft cell geometry with a three to six inch water inlet pressure drop and a cell bypass ratio greater than 1. Specifically: no vortices are formed in the simulated engine bellmouth, the front cell velocity distortion is less than 0.20, the tip circumferential inlet distortion is less than 0.5% and the tip radial distortion is less than 0.25%. The axial pressure gradients as measured on cell walls and the simulated engine fan cowling are well below 0.5 inches of water, which corresponds to less than 0.1% correction to measured thrust due to base pressure differences. N.B.

A82-37716 * # Aerodynamic performance of high turning core turbine vanes in a two-dimensional cascade. J. R. Schwab (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1286.* 19 p. 6 refs.

Experimental and theoretical aerodynamic performance data are presented for four uncooled high turning core turbine vanes with exit angles of 74.9, 75.0, 77.5, and 79.6 degrees in a two-dimensional cascade. Data for a more conservative 67.0 degree vane are included for comparison. Corection of the experimental aftermix kinetic energy losses to a common 0.100 centimeter trailing edge thickness yields a linear trend of increased loss from 0.020 to 0.025 as the vane exit angle increases from 67.0 to 79.6 degrees. The theoretical losses show a similar trend. The experimental and theoretical vane surface velocity distributions generally agree within approximately five percent, although the suction surface theoretical velocities are generally higher than the experimental velocities as the vane exit angle increases. (Author)

A82-37764 # R & D on composite rotor blades at Agusta. V. Giavotto (Milano, Politecnico, Milan, Italy), V. Caramaschi, and G. C. Maffioli (Costruzioni Aeronautiche Giovanni Agusta S.p.A., Varese, Italy). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 16 p. 5 refs.

An R&D program aimed at the development of improved methods for the construction of composite rotor blades is reviewed with reference to the development of a finite element code (Program HANBA 2) for blade section analysis and the development of reliable models for the study of composite behavior and failure criteria. Program HANBA 2 is based on finite element discretization in the section plane only, thus allowing the computation of beam solutions for any shape and material anisotropy or inhomogeneity of the section concerned. In particular, the code allows the evaluation of interlaminar and joint stresses in nonlinear material models with unbalanced anisotropy. Composite rotor blades have been designed and manufactured using the methods developed and are now undergoing static and fatigue tests. V.L.

A82-37785 * # A simple system for helicopter Individual-Blade-Control and its application to stall flutter suppression. N. D. Ham and T. R. Quackenbush (MIT, Cambridge, MA). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 10 p. NASA-sponsored research.

A new, advanced type of active control for helicopters and its application to a system for stall flutter suppression is described. The system, based on previously developed M.I.T. Individual-Blade-Control hardware, employs blade-mounted accelerometers to sense torsional oscillations and feeds back rate information to increase the damping of the first torsion mode. A linear model of the blade and

N82-26283# Boeing Military Airplane Development, Seattle, Wash Advanced Airplane Branch
DESIGN GUIDE FOR AIRCRAFT HYDRAULIC SYSTEMS AND COMPONENTS FOR USE WITH CHLOROTRIFLUOR-ETHYLENE NONFLAMMABLE HYDRAULIC FLUIDS Final Report, May 1976 - May 1980
E T Raymond Wright-Patterson AFB, Ohio AFWAL Mar 1982 71 p refs
(Contract F33615-76-C-2064; AF Proj 3145)
(AD-A112097; AFWAL-TR-80-2111) Avail NTIS
HC A04/MF A01 CSCL 13/7

This design guide documents the major physical properties of chlorotrifluoroethylene (CTFE) polymer-based nonflammable hydraulic fluids and the special considerations which must be observed in the design of aircraft hydraulic systems and components in order to obtain performance comparable to that obtained with petroleum-based hydraulic fluid per MIL-H-5606
Author (GRA)

N82-26284# General Accounting Office, Washington, D C Mission Analysis and Systems Acquisition Div
MISSION EFFECTIVENESS OF THE AV-8B HARRIER 2 COULD BE IMPROVED IF ACTIONS ARE TAKEN NOW Report to the Congress
26 Feb 1982 28 p
(AD-A111878; GAO/MASAD-82-19) Avail NTIS
HC A03/MF A01 CSCL 01/3

The AV-8B Harrier II is a light attack aircraft with vertical and short-takeoff and landing capability being developed by the Navy to provide close air support for Marine Corps amphibian forces The AV-8B is designed to be a substantially improved version of the AV-8A currently used by the Marine Corps Potential maintenance personnel shortages, shipboard space constraints, limited repair capability, and inadequate ground-support equipment could adversely affect the ability of the AV-8B to perform its mission
Author (GRA)

N82-26286# Army Aviation Engineering Flight Activity, Edwards AFB, Calif Directorate for Development and Qualification
AIRWORTHINESS AND FLIGHT CHARACTERISTICS TEST OF AN OH-58C CONFIGURED TO A LIGHT COMBAT HELICOPTER (LCH) Final Report
Arthur R Marshall, Jr, Ralph Woratschek, and Robert N Ward Oct 1981 98 p refs
(AD-A112581; USAAEFA-81-07) Avail NTIS
HC A05/MF A01 CSCL 01/3

The United States Army Aviation Engineering Flight Activity conducted a limited airworthiness and flight characteristics test of the OH-58C Light Combat Helicopter (LCH) from 22 July through 9 September 1981 The OH-58C LCH configuration increases the gross weight of the helicopter to 3425 pounds and includes one 7-tube 2 75-inch rocket pod and one 7 62mm minigun mounted externally Performance and handling qualities were evaluated A total of 20 flights were conducted for a total of 26 0 flight hours As a result of the increased maximum gross weight of the OH-58C LCH, the hover ceiling was reduced Level flight performance was degraded by the LCH configuration No significant handling qualities differences were noted when comparing test results for the OH-58C LCH to the test results of the standard OH-58C
GRA

N82-26287# Army Aviation Engineering Flight Activity, Edwards AFB, Calif Directorate of Development and Qualification
LIMITED ARTIFICIAL AND NATURAL ICING TESTS PRODUCTION UH-60A HELICOPTER (RE-EVALUATION) Final Report, 22 Dec. 1980 - 24 Feb. 1981
Marvin L Hanks, Vernon L Diekmann, and John O Benson Aug 1981 102 p refs
(AD-A112582; USAAEFA-80-14) Avail NTIS
HC A06/MF A01 CSCL 01/3

A limited re-evaluation of the production UH-60A Black Hawk anti-ice and deice systems was conducted to verify correction of deficiencies and shortcomings which were revealed during 1979-1980 icing tests Testing consisted of 22 3 productive flight hours The previous droop stop deficiency (failure of the droop stops to return to the shutdown position with ice accumulation on the rotor head) was corrected by the installation of a different droop stop with anti-ice protection The previous anti-flapping restrainer deficiency (failure of the anti-flapping restrainers to return to the shutdown position with ice accumulated on the rotor head) was downgraded to a shortcoming after correction of the droop stop deficiency The three most important previously identified shortcomings (1) the large increase in power required with ice accumulation on the rotor system, (2) the large power available losses with activation of the engine and engine inlet anti-ice systems, and (3) the poor location of the deice system circuit breakers, were again documented, although some improvement in power available losses was observed due to installation of the modulating engine inlet anti-ice valves Five other previously identified, icing related, shortcomings were still present and four were corrected Three additional icing related shortcomings were identified during these tests (I) ice impact damage to the upper strobe light assembly, (2) ice impact damage to the nose avionics compartment door, and (3) the poor reliability of the windshield anti-ice control units The UH-60 Black Hawk helicopter, configured with the anti-ice, deice and heated government competitive test droop stop systems demonstrated safe operation in icing intensities through moderate
GRA

N82-26288*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va
FLIGHT-TEST VERIFICATION OF A PICTORIAL DISPLAY FOR GENERAL AVIATION INSTRUMENT APPROACH
James J Adams Jun 1982 29 p refs
(NASA-TM-83305; L-15111; NAS 1 15:83305) Avail NTIS
HC A03/MF A01 CSCL 01D

Results of flight tests of the pictorial 'follow me' box display results of the simulator study The most important item of agreement was the frequency of the vertical and lateral models of motion of the pilot-aircraft-display system, which was 0 4 rad/sec in each study Successful short, curved, descending approaches, such as are often suggested for use with microwave landing systems, can be executed with the 'follow me' box display Variations of the value of distance from the aircraft to the box were also examined using values of 736 m, 368 m, and 184 m The results show that successful approaches can be made with all of these values A sharper final turn and greater precision of position control are obtained with the shorter distance Deletion of distance measuring equipment from the system was also studies It was shown that successful approaches can be made with no distance measures included in the system, but the values of distance from the aircraft to the box that can be used are restricted
A R H

N82-26289*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
A FLOATING-POINT/MULTIPLE-PRECISION PROCESSOR FOR AIRBORNE APPLICATIONS
Robert Yee Feb 1982 11 p refs
(NASA-TM-84252; A-8832; NAS 1 15:84252) Avail NTIS
HC A02/MF A01 CSCL 01D

A compact input output (I/O) numerical processor capable of performing floating-point, multiple precision and other arithmetic functions at execution times which are at least 100 times faster than comparable software emulation is described The I/O device is a microcomputer system containing a 16 bit microprocessor, a numerical coprocessor with eight 80 bit registers running at a 5 MHz clock rate, 18K random access memory (RAM) and 16K electrically programmable read only memory (EPROM) The processor acts as an intelligent slave to the host computer and can be programmed in high order languages such as FORTRAN and PL/M-86
S L

N82-26290# Bunker-Ramo Corp, Wright-Patterson AFB, Ohio Electronic Systems Div
TANKER AVIONICS/AIRCREW COMPLEMENT EVALUATION (TAACE). PHASE 1: SIMULATION EVALUATION. VOLUME 1: RESULTS Final Report, Jun. 1979 - Jun. 1980
Ralph P Madero, Gregory J Barbato, and Richard W Moss Wright-Patterson AFB, Ohio AFWAL Nov 1981 60 p refs 2 Vol
(Contract F33615-78-C-3614; AF Proj 2391)
(AD-A110956; AFWAL-TR-81-3127-Vol-1) Avail NTIS
HC A04/MF A01 CSCL 01/3

This report documents a cockpit simulation study conducted to validate the pilot useability of a 3-man (pilot, copilot, boom operator), KC-135 crew system concept Earlier analysis and mockup evaluation studies had established preliminary design criteria and control display arrangements The effort reported herein draws upon this earlier work, and through full mission simulation, validates display formats, cockpit hardware arrangements and crew procedures In addition a 'KC-135 Crew System Criteria' document was written deriving from mission statements and control display research, design criteria for operating the tanker with a reduced crew GRA

N82-26291# Bunker-Ramo Corp., Wright-Patterson AFB, Ohio. Electronic Systems Div.

TANKER AVIONICS/AIRCREW COMPLEMENT EVALUATION (TAACE). PHASE 1: SIMULATION EVALUATION. VOLUME 2: CREW SYSTEM DESIGN Final Report, Jun. 1979 - Jun. 1980

Ralph P. Madero, Gregory J. Barbato, and Richard W. Moss Wright-Patterson AFB, Ohio AFWAL Nov. 1981 126 p 2 Vol.
(Contract F33615-78-C-3614; AF Proj. 2391)
(AD-A110954; AFWAL-TR-81-3127-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 01/3

This report documents the second phase of a two-phase effort called the Tanker Avionics/Aircrew Complement Evaluation (TAACE) Program. The results obtained from a full mission simulation of an updated avionics configuration for the KC-135 tanker are reported herein. These results concern the development of the crew station avionics criteria to be met for a 3-man crew complement (pilot, copilot, boom operator) completing all KC-135 mission requirements without compromise to either mission performance or aircraft operational safety. This volume is divided into three sections. Section I - Introduction; Section II providing sketches of the crew system design layout; and Section III - providing operational systems descriptions of the Navigation Management System and the Horizontal Situation Display are extensive and therefore are presented separately in Appendixes A and B. GRA

N82-26292# Martin Marietta Aerospace, Orlando, Fla.

HELICOPTER NIGHT VISION SYSTEM SIMULATION EVALUATION Final Report

Dec. 1981 138 p refs
(Contract N62269-80-C-0346)
(AD-A110505; OR-16551) Avail: NTIS HC A07/MF A01 CSCL 01/3

Simulation experiments demonstrated the ability of the pilot and copilot to fly a night mission at low altitudes, ranging from 50 to 150 feet AGL, in a CH-53D simulation with the night visionics equipment package described previously. Phases I and II HNVS simulation studies indicated that enroute flight profiles over the simulator's rolling terrain can be accomplished at airspeeds ranging from 60 to 80 knots with clearance altitudes averaging 100 feet. This study was conducted with a revised terrain model with improved altitude feedback cues that produced higher clearance altitudes and somewhat lower airspeeds than the prior simulations. The actual speeds and altitudes will be verified in the planned HNVS flight tests. The simulation confirmed the minimum system requirement of a gimballed FLIR with a navigation system and with ancillary hardware such as a symbol generator. Although this experiment required no data be generated on dead reckoning versus navigation system requirements, both pilot performance and opinion data reiterated the reduced crew station workload with Doppler command steering information. Incorporation of the navigation capability of the Control Display Unit also was instrumental in further reducing the navigation workload. GRA

N82-26293* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THRUST REVERSER FOR A LONG DUCT FAN ENGINE Patent

Everett A. Johnston (GE, Cincinnati) and Edward W. Ryan, inventors (to NASA) (GE, Cincinnati) Issued 14 Jul. 1981 9 p Filed 30 Mar. 1979
(NASA-Case-LEW-13199-1; US-Patent-4,278,220; US-Patent-Appl-SN-025301; US-Patent-Class-244-110B; US-Patent-Class-60-226A) Avail: US Patent and Trademark Office CSCL 21E

A bypass duct outer cowl includes a fixed cascade disposed between axially spaced fixed cowl portions and a translatable cowl sleeve and blocker doors movably disposed on the respective radially outer and inner sides of the cascade. Actuation and linkage structure located entirely within the outer cowl provides for selectively moving the cowl sleeve rearwardly and rotating the blocker doors to a position across the bypass duct to cause the fan airflow to pass through the cascade in a thrust reversing manner.Official Gazette of the U.S. Patent and Trademark Office

N82-26294*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

REAL TIME PRESSURE SIGNAL SYSTEM FOR A ROTARY ENGINE Patent Application

William J. Rice, inventor (to NASA) Filed 19 Feb. 1982 21 p
(NASA-Case-LEW-13622-1; US-Patent-Appl-SN-350473) Avail: NTIS HC A02/MF A01 CSCL 21E

Apparatus for developing a signal which is a composite of the pressures at four different points in the chamber of a rotary type engine is disclosed. The composite signal can be read by an IMEP meter or displayed on an oscilloscope. The physical arrangement of a Wankel engine and the correlation embodying the invention is shown. The profile of the inner surface of a Wankel engine housing and the profile of a three lobed rotor together with the positions of the transducers are also shown. The timing diagrams depicting the active regions of the transducers and timing signals used in the correlator circuitry are illustrated. S.L.

N82-26295*# Pennsylvania State Univ., University Park.

INVESTIGATION OF SPRAY CHARACTERISTICS FOR FLASHING INJECTION OF FUELS CONTAINING DISSOLVED AIR AND SUPERHEATED FUELS Final Report, 1 Aug. 1980 - 31 Aug. 1981

A. S. P. Solomon, L. D. Chen, and G. M. Faeth Washington NASA Jun. 1982 90 p refs
(Grant NsG-3306)
(NASA-CR-3563; NAS 1.26:3563) Avail: NTIS HC A05/MF A01 CSCL 21E

The flow, atomization and spreading of flashing injector flowing liquids containing dissolved gases (jet/air) as well as superheated liquids (Freon II) were considered. The use of a two stage expansion process separated by an expansion chamber, ws found to be beneficial for flashing injection particularly for dissolved gas systems. Both locally homogeneous and separated flow models provided good predictions of injector flow properties. Conventional correlations for drop sizes from pressure atomized and airblast injectors were successfully modified, using the separated flow model to prescribe injector exit conditions, to correlate drop size measurements. Additional experimental results are provided for spray angle and combustion properties of sprays from flashing injectors. Author

N82-26296# Helsinki Univ. of Technology, Otaniemi (Finland). Lab. of Aerodynamics.

TRANSIENT SIMULATION OF GAS TURBINES INCLUDING THE EFFECTS OF HEAT CAPACITY OF THE SOLID PARTS Ph.D. Thesis

Jaakko Larjola 1982 144 p refs
(ISBN-951-752-496-X; Rept-82-A1) Avail: NTIS HC A07/MF A01

The simulation of low frequency transients (such as acceleration, deceleration) of different open cycle gas turbine types is studied. The effects of heat transfer between process gas and solid structure is emphasized. Correcting equations for these effects are developed and the transient properties of each component are then evolved from the static ones with these equations. The heat transfer effects alter significally e.g. the surge margin of the compressor. Simulation model includes intercooler and recuperator. The programming language is CSMP. S.L.

N82-26297*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DEVELOPMENT POTENTIAL OF INTERMITTENT COMBUSTION (I.C.) AIRCRAFT ENGINES FOR COMMUTER TRANSPORT APPLICATIONS

Edward A. Willis 1982 31 p refs Presented at the Commuter Airlines and Operations Meeting, Savannah, 23-24 May 1982
(NASA-TM-82869; E-1221; NAS 1.15:82869) Avail: NTIS HC A03/MF A01 CSCL 21E

An update on general aviation (g/a) and commuter aircraft propulsion research effort is reviewed. The following topics are discussed: on several advanced intermittent combustion engines emphasizing lightweight diesels and rotary stratified charge engines. The current state-of-the-art is evaluated for lightweight, aircraft suitable versions of each engine. This information is used to project the engine characteristics that can be expected on near-term and long-term time horizons. The key enabling technology requirements are identified for each engine on the long-term time horizon. E.A.K.

N82-27257# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING AMATEUR/HOME BUILT AIRCRAFT, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 76 p
(PB82-138975; NTSB-AMM-81-9) Avail: NTIS
HC A05/MF A01 CSCL 01B

Reports of U.S. general aviation accidents involving amateur/home built aircraft are presented. Included are 130 accident briefs, 36 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot certificate, injuries and causal/factor(s). GRA

N82-27258# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
BRIEFS OF ACCIDENTS INVOLVING GLIDERS, U.S. GENERAL AVIATION, 1979
16 Oct. 1981 44 p refs
(PB82-139015; NTSB-AMM-81-13) Avail: NTIS
HC A03/MF A01 CSCL 01B

Reports of all U.S. general aviation accidents, occurring in 1979, involving gliders are presented. Included are 54 accident Briefs, 2 of which involve fatal accidents. The brief format presents the facts, conditions, circumstances and probable cause(s)/factor(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, injury index, aircraft damage, pilot age, injuries and causal factor(s). GRA

N82-27259*# Ohio Univ., Athens. Avionics Engineering Center.
A LORAN-C PROTOTYPE NAVIGATION RECEIVER FOR GENERAL AVIATION
Robert W. Lilley and Daryl L. McCall Aug. 1981 25 p refs
Presented at the 4th Digital Avionics Systems Conf., St. Louis, Nov. 1981
(NASA-CR-169118; NAS 1.26:169118; TM-80) Avail: NTIS
HC A02/MF A01 CSCL 17G

Prototype equipment was developed for flight evaluation which provides enroute navigation in both latitude-longitude and rho-theta coordinates. The nonprecision approach capabilities of this equipment was evaluated. The antenna/preamplifier coupler, the RF processor, tracking loop hardware, tracking loop software, and the video output are discussed. Laboratory and flight test results are evaluated. A.R.H.

N82-27260# Auburn Univ., Ala. Dept. of Electrical Engineering.
MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEM (MATCALS) INVESTIGATION
E. R. Graf, Charles L. Phillips, and Scott A. Starks Apr. 1981 184 p refs Sponsored in part by Georgia Inst. of Technology, Atlanta
(Contract N00039-80-C-0032)
(AD-A107384) Avail: NTIS HC A09/MF A01 CSCL 17/7

The report is organized into three main sections, namely Part Two, Part Three, and Part Four. Part Two contains the results of an investigation into replacing the alpha-beta filter in the MATCALS digital controller with an observer, in order to reduce the effects of radar noise. Part Three presents a centroid algorithm based up return amplitude-versus-angle signature. Part Four presents an investigation of adaptive filtering algorithms for the MATCALS system. GRA

N82-27261# Ohio Univ., Athens. Dept. of Electrical Engineering.
EFFECTS OF HIGH VOLTAGE TRANSMISSION LINES ON NON-DIRECTIONAL BEACON PERFORMANCE Final Report, Jun. 1980 - Oct. 1981
Ismail Ibrahim and Raymond Luebbers Washington FAA Oct. 1981 184 p refs
(Contract DTFA01-80-C-10072)
(AD-A112311; QUEE-FAA-1-2; FAA-RD-81-82) Avail: NTIS
HC A09/MF A01 CSCL 17/7

The potential for high-voltage transmission lines to interfere with the operation of non-directional beacons through the mechanisms of coronagenerated radio noise or passive reradiation of the desired signal has been assessed by use of computer prediction models. The generated noise levels were calculated for both AC and DC lines using methods found in the appropriate literature which have previously been compared with measured data. The reradiated signal levels were computed using a moment-method wire model computer program. This approach was validated by measurements made and reported herein. For all situations considered, it was concluded that locating an NDB near a high-voltage transmission line should not impair the function of the NDB due to either corona noise or passive reradiation from the line. GRA

N82-27262# Center for Naval Analyses, Alexandria, Va. Operations Evaluation Group.
A RESULT IN THE THEORY OF SPIRAL SEARCH
Walter R. Nunn Mar. 1980 16 p refs
(Contract N00014-76-C-0001)
(AD-A112481; CNA-PP-274) Avail: NTIS HC A02/MF A01
CSCL 17/7

This note presents a result in the theory of spiral search which does not seem to be available in the literature in spite of its straightforward derivation and obvious applicability in certain types of 'real life' search problems. The result gives the probability of detection as a function of time for a class of prior distributions of search-object, i.e. target, position centered at the origin of the x,y plane. We restrict attention to a spiral-type search in which the searcher covers the AOU(area of uncertainty) in concentric rings, moving out from the center. In the common case that the prior density is circular normal, the time to detection is seen to be approximately exponentially distributed. This is a somewhat counter-intuitive result in that the detection rate is constant, since it would appear that detection rate must decrease with time as the searcher moves from high probability areas to low probability areas. GRA

N82-27263# Federal Aviation Administration, Atlantic City, N.J.
MICROWAVE LANDING SYSTEM FLARE SUBSYSTEM TEST Data Report, period ending Apr. 1979
Carl B. Jezierski Oct. 1981 43 p refs
(FAA Proj. 075-725-420)
(AD-A107327; FAA-CT-81-61) Avail: NTIS
HC A03/MF A01 CSCL 17/7

Microwave Landing System (MLS) Flare subsystem performance data were collected on a specially instrumented Federal Aviation Administration (FAA) Technical Center aircraft. The airborne data were compared with a theodolite tracking system reference and error plots generated. Due to extensive lightning damage only two flight tests were performed. Flare subsystem accuracy could not be determined because of insufficient data. Author (GRA)

N82-27264# Federal Aviation Administration, Atlantic City, N.J.
HIGH-SPEED ROTARY PRINTING DEVICE FOR AIR TRAFFIC CONTROL APPLICATIONS: A PRELIMINARY EVALUATION Final Report, Aug. 1980 - Apr. 1981
Gerard Spanier Oct. 1981 16 p
(AD-A107325; FAA-CT-81-59; FAA/RD-81/73) Avail: NTIS
HC A02/MF A01 CSCL 09/2

This report describes a unique, high-speed rotary printing device evaluated by the Federal Aviation Administration (FAA) Technical Center to determine potential applicability in air traffic control (ATC) work stations. The report discusses general performance of the unit, basic ATC operational problems being addressed by the study, concepts of application, and future activities for more comprehensive evaluations in simulated and real work station environments. Author (GRA)

N82-27265# Federal Aviation Administration, Atlantic City, N.J.
SURVEILLANCE SIMULATION TESTING OF TERMINAL AND EN ROUTE MODE S SENSORS Interim Report, Apr. - Aug. 1980
Robert E. Frack Jan. 1982 66 p
(FAA Proj. 034-241-510)
(AD-A112250; DOT/FAA/CT-81/16) Avail: NTIS
HC A04/MF A01 CSCL 17/7

A test and evaluation (T&E) was conducted to determine the surveillance characteristics of the Mode S (formerly the Discrete Address Beacon System (DABS) en route and terminal sensors operating with effective receive beam widths of 2.4 deg. and 3.4 deg. The tests were conducted at the FAA Technical Center for terminal and enroute Mode S configurations having maximum ranges of 60 and 200 nautical miles (nmi), respectively. Surveillance loading was simulated using an aircraft reply and interference environment simulator (ARIES) to provide Mode S, Air Traffic Control Radar Beacon System (ATCRBS), or a mixture of the two types of aircraft. Surveillance characteristics were measured by determining the percent detection, blip scan ratio, Mode 3/A and C reliability, Mode S identifier (ID) reliability, and the number of replies per report or interrogations per scan for both types of aircraft. It was concluded that increasing the effective receive beam width had negligible impact on the surveillance characteristics of either sensor operating with simulated Mode S targets. Increasing the effective receive beam width improved the percent detection and Mode C reliability for both sensors operating with simulated ATCRBS targets. GRA

N82-27266# Federal Aviation Administration, Atlantic City, N.J.
MODE S SYSTEM ACCURACY Final Report, Jun. - Oct. 1980
Clifford Chapman and Joseph J. Brady Feb. 1982 69 p refs
(FAA Proj. 034-241-510)
(AD-A112249; FAA-CT-81-67; FAA-RD-81-90) Avail: NTIS HC A04/MF A01 CSCL 17/7

A series of flight tests were performed using three Mode S (formerly the Discrete Address Beacon System (DABS)) sensors for the purpose of determining the capability of each sensor in reporting the true position of an aircraft. For both the Mode S and the Air Traffic Control Radar Beacon System (ATCRBS) mode of operation, slant range, and azimuthal position data, as reported by each sensor, were compared to positional data collected concurrently by a precision range instrumentation system at the Federal Aviation Administration (FAA) Technical Center. GRA

N82-27267# Federal Aviation Administration, Atlantic City, N.J.
DESIGN AND IMPLEMENTATION OF EFFICIENT ALGORITHMS FOR AUTOMATIC DETERMINATION OF CORRECTED SLANT RANGE Final Report
D. W. Stout and R. G. Mulholland Feb. 1982 22 p refs
(FAA Proj. 975-200-10A)
(AD-A112248; FAA-CT-81-30) Avail: NTIS HC A02/MF A01 CSCL 17/7

This report introduces a systematic approach to the design of algorithms for evaluating the corrected slant range in a radar surveillance system. Applications include air traffic control (ATC) operations requiring real-time continuous computation for a multitude of targets without overtaxing available computational resources. From the point of view of accuracy, utilization of memory, and computational speed, the design technique is capable of providing an algorithm that is superior to the corrected slant range technique presently employed in the National Airspace System (NAS). Author (GRA)

N82-27268# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
TERMINAL AIR TRAFFIC CONTROL WITH SURVEILLANCE DATA FROM THE MODE S SYSTEM: RESULTS OF SYSTEM DEMONSTRATIONS TO FIELD CONTROLLERS Final System Demonstration Report, period ending May 1981
Verne Tallio and Haim Gabrieli Feb. 1982 76 p refs
(Contract DTFA01-81-C-10001)
(AD-A112632; MTR-81T7; DOT/FAA/CT-82/11) Avail: NTIS HC A05/MF A01 CSCL 17/7

This report describes the results of a series of system demonstrations of a modified version of the ARTS III system (ADS2) which was developed to operate with target reports provided by the Mode S system. The demonstrations were conducted at the FAA Technical Center with field controllers from the Philadelphia ARTS III facility. The report contains a compilation of the controllers' opinions and comments on the operational characteristics of the new system. This demonstration cannot be considered a comprehensive test and evaluation effort; however, with regard to those system capabilities which were demonstrated, the controllers found no major technical or operational obstacles which would impact the system implementation in an operational environment. Author (GRA)

N82-27269# RAND Corp., Santa Monica, Calif.
AUTOPILOT: A DISTRIBUTED PLANNER FOR AIR FLEET CONTROL Interim Report
Perry W. Thorndyke, David McArthur, and Stephanie Cammarata Jul. 1981 34 p refs
(Contract MDA903-78-C-0029; ARPA Order 3460)
(AD-A107139; RAND/N-731-ARPA) Avail: NTIS HC A03/MF A01 CSCL 17/7

Distributed planning requires both architectures for structuring multiple planners and techniques for planning, communication, and cooperation. We describe a family of systems for distributed control of multiple aircraft, in which each aircraft plans it own flight path and avoids collisions with other aircraft. AUTOPILOT, the kernel planner used by each aircraft, comprises several processing experts that share a common world model. These experts sense the world, plan and evaluate flight paths, communicate with other aircraft, and control plan execution. We discuss four architectures for the distribution of airspace management and planning responsibility among the several aircraft occupying the airspace at any point in time. The architecture differ in the extent of cooperation and communication among aircraft. Author (GRA)

N82-27270# RAND Corp., Santa Monica, Calif.
SCENARIOS FOR EVOLUTION OF AIR TRAFFIC CONTROL
Robert Wesson, Kenneth Solomon, Randall Steeb, Perry W. Thorndyke, and Keith Wescourt Nov. 1981 82 p refs
(Contract MDA903-81-C-0211)
(AD-A112566; RAND/R-2698-FAA) Avail: NTIS HC A05/MF A01 CSCL 17/7

To accommodate the predicted demand for air traffic service in the year 2000, computer technology must augment human control skills. Preliminary laboratory studies have demonstrated that computer programs can track aircraft, predict their future paths, generate conflict-free clearances, and monitor them for compliance-all automatically. This technology could automate most routine ATC tasks and could change the human role in ATC to that of a system manager. How to make the transition to such a system from the present one and exactly what the future specialist's role would be are the issues addressed by this report. We present three scenarios that delineate a spectrum of transition plans: a Baseline scenario in which the human controller's role is emphasized; and AERA (Automated En Route ATC) scenario in which computers assume the primary control responsibility and perform most ATC functions autonomously; and a Shared Control scenario in which automated, individually invokable modules assist a human specialist who retains the primary responsibility for control. GRA

N82-27271# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
GYRO SYSTEMS (SELECTED PAGES)
D. S. Pelpor 19 Mar. 1982 87 p Transl. into ENGLISH of the mono. "Giroskopicheskiye Sistemy" Moscow, 1971 p 5-12, 97-105, 281-293, 431-436, 475-485
(AD-A113748; FTD-ID(RS)T-1768-81) Avail: NTIS HC A05/MF A01 CSCL 17/7

Operating principles are discussed for: (1) differentiating and integrating gyroscopes; (2) gyrostabilizers; (3) course gyros and gyroscopic sensors of the direction of the true vertical; and (4) inertial systems. Schematics are provided of each of these means for control of aircraft, rockets, and spacecraft as well as of their onboard instruments. A diagram of the layout of gyroscopes on the platform of a three dimensional space gyrostabilizer is included. A.R.H.

N82-27272# Ohio State Univ., Columbus. Dept. of Geodetic Science and Surveying.
GRAVITY INDUCED POSITION ERRORS IN AIRBORNE INERTIAL NAVIGATION
Klaus-Peter Schwarz Dec. 1981 60 p refs
(Contract F19628-79-C-0075; AF Proj. 7600)
(AD-A113823; Rept-326; AFGL-TR-82-0030; SR-11) Avail: NTIS HC A04/MF A01 CSCL 17/7

The report investigates the feasibility of improving airborne inertial navigation by use of gravity field approximations which are more accurate than the normal model presently applied. The effect of the anomalous gravity field on positioning is investigated by using a simplified dynamical error model and by deriving analytical expressions for the steady state error via the state space approach. In this approach, changes in the anomalous gravity field are cast into the form of first-order differential equations which are related to a position dependent covariance representation of the gravity field by way of the vehicle velocity. Different possibilities for a state space model of the anomalous

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Shock associated noise of supersonic jets from convergent-divergent nozzles
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tions and a normal shock wave at inlet to the blade passage. The treatment uses both direct and inverse modes of operation for the inviscid and viscous calculations, and thus it can model the separation of the suction surface boundary layer produced by the strong interaction with the shock wave. The inviscid flow is calculated by a time marching method and the viscous flow by integral methods for laminar and turbulent boundary layers. (Author)

A82-35366 # Application of high bypass turbofan computer simulation to flight and test data processing. J. F. Chapier and L. Levine (Avco Corp., Avco Lycoming Div., Stratford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-141.* 8 p. Members, $2.00; nonmembers, $4.00.

This paper describes the computer program used to compare gas turbine engine flight and static test results with a predicted standard engine computer simulation model. The program is conceived not only for a final presentation of engine performance, but also as a research tool to further analyze the validity of measurements and the assumptions used in data reduction. (Author)

A82-35371 # Effect of crossflows on the discharge coefficient of film cooling holes. N. Hay, D. Lampard, and S. Benmansour (Nottingham University, Nottingham, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London England, Apr. 18-22, 1982, Paper 82-GT-147.* 6 p. 9 refs. Members, $2.00; nonmembers, $4.00.

Film cooling is the standard method of cooling the stator and rotor blades in an aircraft gas turbine engine. Many parameters govern film cooling performance, but the most pertinent is the 'blowing parameter', a nondimensionalized parameter reflecting the mass flow emerging from the cooling hole. Knowledge of the discharge coefficient, Cd, of film cooling holes is vital in sizing film cooling holes at the design stage. The discharge coefficient depends both on the local geometry and the flow conditions upstream and downstream of the hole. The effect of coolant crossflow was examined by Rohde et al. (1969). No data are available on the combined effects of mainstream and coolant crossflows. The present investigation was undertaken to provide a more extensive data base. Further data on Cd for film cooling holes have been obtained, taking into account data on both the coolant and mainstream sides. For the simpler situation of crossflow on one side only, the data agree well with earlier published results. G.R.

A82-35373 * # The use of optimization techniques to design controlled diffusion compressor blading. N. L. Sanger (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-149.* 11 p. 17 refs. Members, $2.00; nonmembers, $4.00.
(Previously announced in STAR as N82-14094)

A82-35374 # A practical approach to the design of multivariable control strategies for gas turbines. A. M. Foss (National Gas Turbine Establishment, Farnborough, Hants., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-150.* 12 p. 15 refs. Members, $2.00; nonmembers, $4.00.

The requirement for gas turbine engines to operate over wider ranges has resulted in today's more sophisticated engines with multiple controls. Current control philosophy for such powerplants is to adopt separate control systems for each of the major components. However, interactions between the various control parameters involved may be large enough to degrade the transient performance of the overall system. In such cases a design strategy specifically aimed at such a system, may be better. In the considered multivariable approach, a multivariable design strategy has been applied to derive a multivariable controller. According to the definition of the term, a multivariable design strategy is a strategy which takes into account interactions in the plant to be controlled. A multivariable controller contains interaction terms in the controller. The practical application of a multivariable control scheme to an aircraft engine has been made feasible in connection with the development of the microprocessor. G.R.

A82-35380 # Scaling effects on leakage losses in labyrinth seals. S. L. K. Wittig, L. Dörr, and S. Kim (Karlsruhe, Universität, Karlsruhe, West Germany). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-157.* 5 p. 8 refs. Members, $2.00; nonmembers, $4.00.

The accurate prediction of leakage losses through labyrinth seals in gas turbine engines depends largely on exact measurements. As tolerance effects are important, scaled-up models are used for experimental analysis. Application to real size engine conditions is of predominant importance. Measurements in a newly developed test section over wide pressure ranges with geometrically similar straight-through seal models of different scale indicate that the flow coefficient is not independent of the scale chosen. In a first attempt to clarify these questions, the results obtained from various models were correlated using Fanno-line analysis with dimensionless integral friction coefficients. The results obtained reveal the necessity for simultaneous consideration of Reynolds and Mach-number effects as well as relatively small geometrical deviations. (Author)

A82-35383 # Dry friction damping mechanisms in engine blades. A. V. Srinivasan and D. G. Cutts (United Technologies Research Center, East Hartford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-162* 14 p. 11 refs. Members, $2.00; nonmembers, $4.00.

In the context of jet engines, significant vibration damping due to dry friction can occur at (1) shroud interfaces of fans and (2) the platform of turbine blades fitted with 'platform dampers'. Analytical and experimental studies in regard to this important source of nonaerodynamic damping of blade vibration are presented in this paper. Comparisons between results from analytical models and laboratory test data are made and discussed. (Author)

A82-35384 * # The influence of Coriolis forces on gyroscopic motion of spinning blades. F. Sisto, A. Chang, and M. Sutcu (Stevens Institute of Technology, Hoboken, NJ). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-163.* 6 p. 5 refs. Members, $2.00; nonmembers, $4.00. Grant No. NAG3-47.

Turbomachine blades on spinning and precessing rotors experience gyroscopically induced instabilities and forcing. With vehicle-mounted turbomachines, either constant or harmonic precession occurs, depending on vehicle or mount motion. Responses of uniform cantilever beams at arbitrary stagger, subjected to the noted rotor motion, are predicted in both self-excited and forced-excitation modes taking into account Coriolis acceleration. (Author)

A82-35385 # Integrated aircraft avionics and powerplant control and management systems. J. McNamara (Rolls-Royce, Ltd., Aero Div., Bristol, England) and A. G. Seabridge (British Aerospace Public, Ltd., Co., Warton Div., Preston, Lancs., England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-165.* 12 p. 7 refs. Members, $2.00; nonmembers, $4.00.

The need for integration of the powerplant, intake, and airframe in an aircraft has long been recognized as an essential requirement for maximizing performance achievement in combat aircraft, and the emergence of highly maneuverable and highly unstable aircraft configurations has enhanced the need for this integration. In the present study of powerplant control systems, a systems approach has, therefore, been adopted to ensure that the results obtained for an integrated control system are truly applicable to the combined system. Attention is given to a powerplant control system configuration, the data highway system, the powerplant control and management system, a system for the 1990's, and the benefits provided by an ideal system. It is pointed out that the optimum solution will ultimately be dictated by the constraints and objectives of the aircraft project. G.R.

A82-35387 # Measurements of heat transfer coefficients on gas turbine components. I - Description, analysis and experimental verification of a technique for use in hostile environments. B. Barry, A. E. Forest, and A. J. White (Rolls-Royce, Ltd., Derby, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-174.* 9 p. 9 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Ministry of Defence (Procurement Executive).

A method of determining local convective heat transfer coefficients around internally cooled components in a hostile flow environment is described. The method involves the measurement of the response of the wall temperature to perturbations in the coolant flow. A companion paper includes results obtained in cascades of turbine aerofoils using refined versions of the method. (Author)

A82-35388 # Measurements of heat transfer coefficients on gas turbine components. II - Applications of the technique described in part I and comparisons with results from a conventional measuring technique and predictions. R. J. Beacock, F. G. Horton, T. J. Kirker, and A. J. White (Rolls-Royce, Ltd., Derby, England). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-175.* 7 p. 5 refs. Members, $2.00; nonmembers, $4.00. Research supported by the Ministry of Defence (Procurement Executive).

A82-35389 * # NASA research in aircraft propulsion. M. A. Beheim (NASA, Lewis Research Center, Cleveland, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-177.* 10 p. Members, $2.00; nonmembers, $4.00.
(Previously announced in STAR as N82-13146)

A82-35390 # HC and CO emission abatement via selective fuel injection. D. W. Bahr (General Electric Co., Aircraft Engine Business Group, Cincinnati, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-178.* 9 p. 5 refs. Members, $2.00; nonmembers, $4.00.

The results of investigations to develop carbon monoxide (CO) and unburned hydrocarbons (HC) abatement methods for use in aircraft turbofan engines are reviewed. Specifically, the use of selective fuel injection patterns at ground idle operating conditions in CF6 engines was assessed and evolved in combustor and engine tests. These fueling patterns were obtained by valving fuel to selected combinations of fuel nozzles at idle, rather than to the full complement of engine fuel nozzles, and were intended to provide localized fuel-air ratio enrichment within the combustor annulus. In addition to the effects of such fueling patterns on HC and CO levels, their effects on engine performance at starting, sub-idle, and idle conditions were determined. The use of repetitive clusters of fueled nozzles around the combustor annulus was determined to provide the best overall emission abatement, performance, and operational characteristics. (Author)

A82-35391 # Status report of the USAF's Engine Model Derivative Program. M. S. Coalson (USAF, Wright-Patterson AFB, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-183.* 9 p. Members, $2.00; nonmembers, $4.00.

An investment strategy, known as the Engine Model Derivative Program has resulted in the prototype development of a new fighter engine, a new turboprop engine, and promises the future development of a second fighter engine. The rationale for prototype, rather than full-scale development is presented and a brief overview of the F101 derivative fighter engine, XT56-100 and F100 advanced derivative is described. (Author)

A82-35392 # Demonstration of ceramic hot-section static components in a radial flow turbine. J. P. Arnold, W. McGovern (U.S. Army, Mobility Equipment Research and Development Command, Fort Belvoir, VA), J. C. Napier, and A. P. Batakis (Solar Turbines, Inc., San Diego, CA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-184.* 6 p. 9 refs. Members, $2.00; nonmembers, $4.00. Army-sponsored research.

Ceramic hot-section turbine components allow higher temperature for up-rated power and improved fuel economy. The methodology used in arriving at a successful 200-hr engine demonstration of an all ceramic nozzle is presented along with current progress in demonstrating the remaining ceramic hot-section static components. (Author)

A82-35394 # A stage-by-stage dual-spool compression system modeling technique. M. W. Davis, Jr. (Sverdrup Technology, Inc., Arnold Air Force Station, TN). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-189.* 11 p. 16 refs. Members, $2.00; nonmembers, $4.00.

Mathematical compressor models are major tools used in resolving engine problems and evaluating the influence of compressor modifications on performance and stability. This paper discusses the development of a one-dimensional, time-dependent, dual-spool, stage-by-stage compression system mathematical model and its application to a current compression system. The dual-spool model was constructed by extending a current single-spool modeling technique to include dual-spool compression systems. To improve the numerical stability characteristics of the compressor modeling technique, the dual-spool model was formulated using MacCormack's (1969) explicit differencing scheme and a method of characteristics boundary treatment. The dual-spool model was applied to a current compression system, and several types of planar destabilizing disturbances were studied to determine their effect on compression system stability. Model predictions were validated against experimental data whenever possible. (Author)

A82-35396 # TURBOTRANS - A programming language for the performance simulation of arbitrary gas turbine engines with arbitrary control systems. J. R. Palmer (Cranfield Institute of Technology, Cranfield, Beds., England) and C.-Z. Yan (Shenyang Aeroengine Research Institute, Shenyang, People's Republic of China). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-200.* 8 p. 8 refs. Members, $2.00; nonmembers, $4.00.

TURBOTRANS is a new computer program, written in FORTRAN IV and implemented on various computers, which satisfies the requirements of flexibility, accuracy, ease of use, and suitability. The component performance, steady-state performance simulation, and transient performance simulation are analyzed. The configuration of the gas turbine engine and control system can be described in the program by using codewords corresponding to the various components and processes of both engine and control systems. A flow diagram of TURBOTRANS and a brief description of the function of each main subroutine are given. Illustrations of the program's capabilities are presented. C.D.

A82-35398 # Aeropropulsion research for the U.S. Army. R. E. Singleton (U.S. Army, Research Office, Research Triangle Park, NC). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-203.* 11 p. 20 refs. Members, $2.00; nonmembers, $4.00.

Examples are presented of U.S. Army-supported research in aeropropulsion static and rotating component design and manufacture, with emphasis on anticipated improvements in engine reliability, life cycle costs, and fuel consumption. The investigations extend to centrifugal flow compressor rotors and variable area nozzles, counterflow film-cooled combustors, felt-ceramic liner annular combustor concept development, turbine blade thermal barrier coatings, gear tooth dynamics, turbine seals, such advanced ceramics as silicon nitride, and polyimide composite fan blades. O.C.

A82-35400 # Adaptive fuel control feasibility investigation for helicopter applications. T. Morrison, R. D. Zagranski (Chandler Evans, Inc., West Hartford, CT), and J. J. Howlett (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-205.* 11 p. Members, $2.00; nonmembers, $4.00.

A United States Army-sponsored, computer-aided study of a twin engine helicopter is being conducted to determine the feasibility of incorporating into the engine microprocessor-based control system, airframe signals and control strategies that improve helicopter capability. Investigations are considering online changes to the control characteristics which adapt to abnormal engine operation due, for example, to engine deterioration, surge or failure. The anticipation of power recovery from a split needle condition is accomplished with rotor speed feedback, which allows increased transient load factors and improved handling qualities in maneuvering flight. An improvement in torsional damping is achieved with software filters which reduce the dependence of the drive train stability on the blade lag dampers. (Author)

A82-35401 # Local heat transfer to staggered arrays of impinging circular air jets. A. I. Behbahani and R. J. Goldstein (Minnesota, University, Minneapolis, MN). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-211.* 7 p. 16 refs. Members, $2.00; nonmembers, $4.00.

Measurements are made of the local heat transfer from a flat plate to impinging arrays of staggered circular air jets. Fluid from the spent jets is constrained to flow out in one direction. Two different jet-to-jet spacings, 4 and 8 jet diameters, are employed. The parameters that are varied include jet-orifice-plate to impingement-surface spacing and jet Reynolds number. Local heat transfer coefficients vary periodically both in the flow direction and across the span with high values occurring at stagnation regions. Stagnation regions of individual jets as determined by local heat transfer coefficients move further in the downstream direction as the amount of crossflow due to upstream jet air increases. Local heat transfer coefficients are averaged numerically to obtain spanwise and streamwise-spanwise averaged heat transfer coefficients. (Author)

A82-35402 # Acquisition of F-100/3/ high pressure compressor entrance profiles. D. C. Rabe, W. W. Copenhaver, and M. S. Perry (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-215.* 5 p. 6 refs. Members, $2.00; nonmembers, $4.00.

A transportable automatic data acquisition system to obtain high pressure compressor entrance profiles in an F-100 Series 3 gas turbine engine is described. The system was developed, assembled, and tested at Wright-Patterson Air Force Base and transported to a remote location for implementation in a sea level engine test. Acquisition of data was controlled through a Hewlett Packard Model 9825T desktop calculator, preprogrammed to display airflow data in engineering units during the test. Entrance profiles of total and static pressure, temperature, and flow angle for two axial locations are presented. A wedge probe sensing element was positioned at 12 radial locations by remote traversing mechanisms to obtain these profiles. For a total pressure range of 18 to 46 psia (0.13 to 0.32 MPa), acquisition uncertainties in static and total pressure were reduced to below + or - percent of measured values by optimizing data system component uncertainties. (Author)

A82-35404 # Advanced turboprop engines for long endurance naval patrol aircraft. R. Hirschkron and R. H. Davis (General Electric Co., Aircraft Engine Business Group, Lynn, MA). *American Society of Mechanical Engineers, International Gas Turbine Conference and Exhibit, 27th, London, England, Apr. 18-22, 1982, Paper 82-GT-217.* 7 p. Members, $2.00; nonmembers, $4.00. Navy-sponsored research.

Long endurance naval patrol aircraft of the future will require more efficient advanced turboprop powerplants. Engines used in this kind of application will have performance requirements emphasizing prolonged endurance and very low specific fuel consumption for cruise and part-power loiter operation. Regeneracontrol system dynamics is used to give qualitative and quantitative guidance in the design process as well as to aid in analysis of experimental results. System performance in wind tunnel tests is described, and evidence is given of the system's ability to provide substantial additional damping to stall-induced blade oscillations. (Author)

A82-37766 # CFC drive shaft and GFC coupling for the tail rotor of the BO 105. C. M. Herkert, D. Braun, and K. Pfeifer (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 27 p.

A new tail rotor drive system using a carbon fiber composite shaft and glass fiber composite couplings is being designed for the BO 105 instead of the existing metal version with a view to reducing the mass and the cost of the drive system. The discussion covers general design requirements, analytical evaluation of several design concepts including bolted and bonded versions, manufacturing techniques, tool design, test results and cost effectiveness of the proposed designs. It is shown that the composite version of the tail rotor drive system would provide a 10% reduction in the manufacturing cost, a mass reduction of 4 kg for the long shaft and 1 kg for the short shaft, and, possibly, a reduction in the number of parts. V.L.

A82-37767 # Quantification of helicopter vibration ride qualities. C. E. Hammond and D. D. Hollenbaugh (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 14 p. 8 refs.

Absorbed power, a measure of the rate at which the body absorbs energy when subjected to vibration (as developed by the U.S. Army TACOM), is used as a means for quantifying helicopter vibration ride quality. Vibration tests, performed on pilots of five different operational U.S. Army helicopters are converted to absorbed power using calculations derived for quantitative measures of ride quality for ground vehicles. The results are compared to previously obtained data showing acceptable subjective response for helicopter vibration levels and ISO 2631 reduced proficiency boundaries (both converted to absorbed power). Absorbed power measurements from the operational helicopters are, in general, higher than the values from these comparative boundaries and fall between the levels for acceptable ride quality of automobiles and off-road vehicles (0.2-6 W). Further research using the NASA-Langley Research Center Passenger Ride Quality Apparatus, is planned. N.B.

A82-37768 # Practical application of a computerized flight by flight fatigue test system. A. Jorio and G. Parenti (Costruzioni Aeronautiche Giovanni Agusta S.p.A., Varese, Italy). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 17 p.

Requirements related to the procedure leading to the certification of a helicopter, and general developments concerning the state of the art provided the motivation for modernizing the equipment used in fatigue testing. The modernization made it possible to reduce the time required for testing, and to minimize needs for operator assistance during the test. It was also possible to improve accuracy and reliability. A flight test data survey is conducted, and flight by flight fatigue tests are discussed. A description of a computer controlled system is presented, taking into account the system definition, the software philosophy, the system architecture, and a system functional description. G.R.

A82-37769 # Quasi-static and dynamic crushing of energy absorbing materials and structural components with the aim of improving helicopter crashworthiness. C. Kindervater (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Stuttgart, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 26 p.

Energy absorbing tests are performed on several materials and structural components, such as aluminum honeycomb, thin-walled aluminum and steel cylinders, PUR-foam cylinders, and fiber-reinforced cylindrical tubes, with the eventual goal of improving helicopter crashworthiness. Axial crushing tests, under quasi-static and impact loading, are conducted to determine several key energy absorbing parameters for these materials and structures, including specific energy, energy dissipation density, stroke efficiency and operating stress. Fiber-reinforced tubes gave the best results, having a specific energy value of about twice the maximum observed for aluminum honeycomb and about six times the best value for foam-filled metal cylinders. Little difference is shown between the static and dynamic failure modes. Finally, a crash test structure is drop tested with some selected structural elements acting as energy absorbers and the results are compared to crash cases simulated using a computer program. The comparison tests showed that accurate estimations of the dynamic response of the total structural assembly can be obtained by using statically-determined load deflection characteristics of the absorbing elements. N.B.

A82-37770 # Joint Anglo-American experience of the analysis of helicopter rotor blade pressure distribution. D. J. Merkley (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA), M. J. Riley, and C. Young (Royal Aircraft Establishment, Farnborough, Hants., England). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 21 p. 8 refs.

NASA, the U.S. Army, and the Royal Aircraft Establishment (RAE), UK, are collaborating in a study to develop interactive computer systems for use in analyzing helicopter rotor blade pressure distribution measurements. Flight tests on AH-1G and Wessex helicopters provided data which were then analyzed using two different computer program systems. The RAE interactive graphics programs perform curve fitting and integration routines which enable force and moment coefficient plots to be visually displayed, and for regions of interest, such as where blade section limitations are apparent, to be located for the more detailed study of chordwise pressure distribution. The U.S. team incorporated and considerably extended the RAE programs into a computer software system called DATA-MAP, which offers the convenience of fully interactive graphics to display the pressure measurements in absolute values or coefficient form against time, chord or radius, to derive forces and moments, and to optimize scaling as the analysis proceeds. Examples of the plots obtained from both systems are included. Two joint workshops have been held to exchange information and to correlate the various data bases (test and analytic). Further cooperative efforts are planned. N.B.

A82-37771 # Ageing of composite rotor blades. F. Och (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 16 p. 6 refs.

Long term effects of the environment on composite rotor blades used in different climatic zones are evaluated by means of coupon testing (sections cut out of blades) and tests of full-scale components. Blades with 2600, 3700 and 6100 flight hours, flown over the Gulf of Mexico and the North Sea region, show a reduction in interlaminar shear strength due to accelerated aging, but no weathering influence is found on bending strength. Artificial weathering of coupon specimens yields a significant reduction in the endurance limit of matrix controlled properties after sufficient time of exposure (500 hr). Full scale fatigue testing indicates that there is no adverse influence of service usage on composite rotor blades. In general, composite material fulfills its expected advantages, making it the best structural material for rotory wing applications. N.B.

A82-37772 # Helicopter design synthesis. O. R. Ramos and P. Taylor (Southampton, University, Southampton, England). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th. Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 22 p. 16 refs. Research supported by the Ministry of Defence (Procurement Executive).

A modular computer program is developed to aid the preliminary design analysis of the aerodynamic and dynamic characteristics for projected base-line helicopters of conventional configuration. The computer program, called HELISOTON, allows time-efficient assesament of the multi-variable relationships between the various input design requirements in the earliest stages of project definition. HELISOTON consists of an iteration procedure for automated prediction of a helicopter's AUW, installed power and size as a function of the aircraft role, specification and mission profile. When the basic iteration is linked to a series of outer iterative loops, the program then carries out simple optimization decisions related to the preliminary stages of design and can be used to simply select design parameters, ruling out those solutions that cannot be expected to lead to efficient or practical final base-line designs. HELISOTON can also be used for data generation in conjunction with external optimization programs covering fields wider than aerodynamics and dynamics and/or using more detailed, time-consuming computational models. Sample program results are included to illustrate the potentialities of the program and the several modes in which the program can be advantageously operated. N.B.

A82-37773 # Factors shaping conceptual design of rotary-wing aircraft. W. Z. Stepniewski. *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 18 p. 10 refs.

The investigation is mainly concerned with the most important design parameter value trends as exhibited by the foremost design schools represented by the Soviet Union and the Western nations. In addition to pure helicopters of various configurations, a few new rotary-wing concepts as the tilt rotor, ABC, and the X-wing are considered so that their competitive positions with respect to classical helicopters can be assessed. A number of Soviet helicopters listed in a table include, in addition to examples of traditional Soviet design philosophy, also the Mi-24 and Mi-26 as examples of the new Soviet design philosophy adopted by the Tishchenko design team. The Western rotorcraft selected for the comparative study include single-rotor and tandem helicopters ranging in maximum gross weights from about 5000 to almost 150,000 pounds. The state of the art of powerplants is examined, taking into account Western and Soviet engines. Attention is given to disk loading, power loading, tip speed, advancing blade-tip Mach number and advance ratio barrier, and weight and energy aspects. G.R.

A82-37775 # **An automatic map reader suitable for use in helicopters.** G. F. Walker (Marconi Avionics, Ltd., Rochester, Kent, England). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmish-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 11 p. 6 refs.

The automatic map reader (AMR) is a portable, hand-held navigation device designed to greatly increase navigational accuracy in tactical helicopters, particularly in the Nap-of-the-Earth flight environment. The AMR incorporates several features which make it attractive for use in helicopters, including the use of unprepared standard maps, the unlimited orientation of the map, low weight, and low cost. The interface unit of the AMR converts data from the navigational computer into a form suitable for use by the display head, which contains two discs, drive mechanisms, display and processor electronics, and the system operational controls. Flight position is indicated by the intersection of lines engraved on two separately movable circular discs. Flight evaluation tests demonstrated the effectiveness of the AMR in terms of performance and cost at an overall weight and size suitable for helicopter use. N.B.

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A82-37776 # **Optimization of blade pitch angle for higher harmonic rotor control.** H. G. Jacob (Braunschweig, Technische Universität, Brunswick, West Germany) and G. Lehmann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmechanik, Braunschweig, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmish-Partenkirchen, West Germany, Sept. 8-11, 1981, Paper.* 29 p. 7 refs.

An achievement of improved harmonic control in the case of helicopter rotors makes it possible to reduce oscilatory hub forces and moments, decrease blade stresses, increase performance, and avoid instabilities of blade motion. The present investigation is concerned with numerical studies which have been conducted to enhance the harmonic control of helicopter rotor blades. Three different mathematical models are employed to show the effectiveness of improved harmonic blade control and to provide an overview concerning the sensitivity of the control inputs. An optimization method is discussed, and the time dependent optimal control of the blade pitch angle is considered. Attention is given to the mathematical model of a rotor with rigid blades and flap hinges, and a mathematical model of a rotor system with elastic blades. G.R.

A82-37777 * **General purpose research rotor.** R. Jones, H. E. Howes (Kaman Aerospace Corp., Bloomfield, CT), and L. A. Haslim (NASA, Ames Research Center, Moffett Field, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-9.* 15 p.

An analytical study, under a NASA contract, is performed on an advanced flight research rotor (four-bladed, 54 ft in diameter, with bearingless rotor retention characteristics) to determine the sensitivity of total rotor characteristics such as vibratory hub loads, rotor horsepower, and blade loads, to parametric variability of the rotor configuration. The sensitivity of the rotor to various combinations of blade planform taper, percent of blade span that is tapered, tip sweep angle, built-in-twist, and torsional frequency is determined for specific configurations by randomly selecting combinations of these parameters. Characteristics of other intermediate rotor configurations are determined by a regression analysis. The results show that a wide range of rotor total performance characteristics can be obtained for a rotor trimmed to the same flight conditions. The regression equations predict total performance of the rotor very well and appear to be a useful analytical tool for rotor design optimization. Figures showing the results of the various tests are given along with a table of the regression coefficients. N.B.

A82-37778 **Low vibration design of AAH for mission proficiency requirements.** B. P. Gupta and E. R. Wood (Hughes Helicopters, Inc., Culver City, CA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-2.* 9 p. 11 refs.

The Army Advanced Attack Helicopter (AAH) considered in the investigation has a four-bladed fully articulated rotor which turns at 289 RPM. The aircraft basic design gross weight is 14,660 lbs. The two-men crew includes a pilot and a copilot gunner. AAH design features for low vibration are considered, taking into account also a program to reduce even further the low vibration levels in the basic aircraft. A flight spectrum approach to helicopter vibration specifications is discussed, giving attention to helicopter vibrations and airspeed, Miner's rule applied to helicopter vibrations, the primary mission profile for the AAH, and a typical structural component S-N curve. The criterion of 'hours before proficiency degrades' relates the complex crew vibration environment to a single quantity which is physically significant. G.R.

A82-37779 **Army helicopter crew seat vibration - Past performance, future requirements.** S. T. Crews and W. W. Hamilton (U.S. Army, Qualifications Directorate, St. Louis, MO). *American Helicopter Society, Northeast Regional National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-3.* 8 p. 12 refs.

The Army is interested in setting vibration specifications as a means to insure that pilot, copilot, and crew are able to perform whatever tasks they have to accomplish to make their mission a success. Mission tasks vary in different flight regimes and for different missions. The level of vibration which will interfere with task performance will vary consequently with flight regime and mission, and, correspondingly, the vibration specifications should vary also. Investigations related to an establishment of suitable vibration specifications for Army helicopters are discussed, taking into account ride quality research, the intrusion index, flight test results, and Army ride quality specifications. The results of the study show that the Army has achieved marginally acceptable vibration related ride quality on its operational helicopters. G.R.

A82-37780 **The Helicopter Ride Revolution.** R. W. Balke (Bell Helicopter Textron, Fort Worth, TX). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-4.* 15 p. 33 refs.

It is pointed out that the Helicopter Ride Revolution began in earnest with the stringent requirements of a draft in 1971. It will conclude with the achievement by the helicopter industry of a jet-smooth ride by the end of the century. The major technological milestones which must be met to achieve this goal on schedule are developed through an evaluation of the interdependence of design and analytical techniques and the duration of a typical system-acquisition cycle. The 30 years between the first impetus in 1971 and the year 2000, when the first helicopters with a jet-smooth ride are scheduled for completion, can be characterized by three 10-year periods, including the reactive era, the technological development era, and the application or maturity era. For the achievement of a jet-smooth ride it will be necessary that the vibration levels, along all axes and across the frequency band, be equivalent to those of a typical jetliner. In addition, all other factors affecting the sensory perceptions must also be equivalent. G.R.

A82-37781 **Improved methods in ground vibration testing.** E. J. Nagy (Kaman Aerospace Corp., Bloomfield, CT). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-6.* 10 p.

Methods and procedures developed during ground vibration testing of an Army AH-1G helicopter airframe, which improve the validity of the test results and establish certain ground rules for the performance of this type of testing, are described. The optimum excitation technique is found to be the logarithmic swept sinusoidal testing after the initial locations of modal natural frequencies are found with the random excitation technique. Forcing levels need to be increased to levels unheard of in the industry (at least 300 lb) in order to reach the true linear range of the airframe. Various sources of error are identified, including the high frequency residual (local mode) effect which may or may not appear at the various driving points of the structure. The use of the autospectra, the coherence function, the transfer function, and the input and output signals displayed on a dual-channel oscilloscope are means of verification that good mobility spectra will be available for determination of the global parameters. N.B.

A82-37782 **Determination of in-flight helicopter loads and vibration.** N. Giansante, R. Jones (Kaman Aerospace Corp., Bloomfield, CT), and N. J. Calapodas (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). *American Helicopter Society, Northeast Region National Specialists' Meeting on Helicopter Vibration: Technology for the Jet Smooth Ride, Hartford, CT, Nov. 2-4, 1981, Preprint 81-7.* 8 p.

It is pointed out that the helicopter industry has generally experienced difficulty in making analytical predictions of airframe vibrations. A number of approaches have been developed in an attempt to solve the problems of helicopter vibratory response prediction. The present investigation had the objective to explore merits and suitability of these approaches. One technique, called Force Determination methodology, was found to make it possible to determine successfully the magnitudes and phase angles of vibratory forces acting on AH-1G airframe. The 'Automated Dynamic Analytical Model Improvement Technique' could be implemented

N82-26298*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

PROPULSION OPPORTUNITIES FOR FUTURE COMMUTER AIRCRAFT

William C. Strack 1982 27 p refs Presented at 18th Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; sponsored by AIAA, SAE and ASME
(NASA-TM-82915; E-1304; NAS 1.15:82915) Avail: NTIS HC A03/MF A01 CSCL 21E

Circa 1990 propulsion improvement concepts are discussed for 1000 to 5000 SHP conventional turboprop powerplants including engines, gearboxes, and propellers. Cycle selection, power plant configurations and advanced technology elements are defined and evaluated using average stage length DOC for commuter aircraft as the primary merit criterion. B.W.

N82-26299*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

COMPARISON OF EXPERIMENTAL AND ANALYTICAL PERFORMANCE FOR CONTOURED ENDWALL STATORS

Robert J. Boyle and Jeffrey E. Haas (Army Aviation Research and Development Command, Cleveland) 1982 15 p refs Presented at Eighteenth Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; sponsored by AIAA, SAE and ASME
(NASA-TM-82877; NAS 1.15:82877; AVRADCOM-TR-82-C-12) Avail: NTIS HC A02/MF A01 CSCL 21E

Comparisons between predicted and experimental stator losses showed that the analysis was able to predict the change in stator loss when contoured endwalls with highly three dimensional passage geometry were used. The level of loss was predicted to within 75 percent of that measured. The predicted loss was due only to profile loss and boundary layer growth on the endwalls. The 25 percent difference was approximately 0.015 at design pressure ratio. The analysis was shown to predict the trend in stator flow angle, even for small stator geometries. Author

N82-26300*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

NASA RESEARCH IN SUPERSONIC PROPULSION: A DECADE OF PROGRESS

L. H. Fishbach, L. E. Stitt, J. R. Stone, and J. B. Whitlow, Jr. 1982 40 p refs Presented at 18th Joint Propulsion Conf., Cleveland, 21-23 Jun. 1982; sponsored by AIAA, SAE and ASME
(NASA-TM-82862; NAS 1.15:82862) Avail: NTIS HC A03/MF A01 CSCL 21E

A second generation, economically viable, and environmentally acceptable supersonic aircraft is reviewed. Engine selection, testbed experiments, and noise reduction research are described. Author

N82-26301# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.

EFFECT ON FUEL EFFICIENCY OF PARAMETER VARIATIONS IN THE COST FUNCTION FOR MULTIVARIABLE CONTROL OF A TURBOFAN ENGINE M.S. Thesis

Barry Lawrence Dougherty Sep. 1981 106 p refs
(AD-A110614) Avail: NTIS HC A06/MF A01 CSCL 21/5

In modern turbofan engines, variable geometry has been incorporated to improve some off-design performance. Most control designs ignore this variable geometry and use fuel metering as the primary control input. This thesis investigates the use of variable geometry to control the engine and, thereby, reduce fuel consumption due to transients. Additionally, steady-state trim conditions are altered to reduce the static fuel consumption. The non-linear transient simulation program is used to analyze the steady-state operating condition and develop small perturbation control limitations. Linear models, both large and reduced order, are used in analyzing the effect of controllers on system response. A computer program was generated to reduce a large order linear model to a usable size for control system development. This analysis shows the reduced-order regime dependent controllers to be viable and to favorably enhance the quest for reducing specific fuel consumption in existing engines. Author (GRA)

N82-26302# Naval Postgraduate School, Monterey, Calif. Dept. of Mechanical Engineering.

PERFORMANCE OF MULTIPLE, ANGLED NOZZLES WITH SHORT MIXING STACK EDUCTOR SYSTEMS M.S. Thesis

Charles Carver Davis Sep. 1981 435 p refs
(AD-A110817) Avail: NTIS HC A19/MF A01 CSCL 21/5

Cold flow tests were conducted on a four-nozzle gas eductor system to evaluate the feasibility of reducing mixing stack lengths by the application of angled primary flow nozzles. Three short mixing stacks with length to diameter ratios of 1.75, 1.5, and 1.25 were tested using a set of straight nozzles and a series of angled nozzles having tilt angles of 10, 15, 20 and 22.5 degrees. The nozzles were constructed with an area of primary flow to area of mixing stack ratio of 2.5. Pumping coefficients, mixing stack pressure distributions, flow changes, exit velocity profiles, and back pressures were used to evaluate the various mixing stack length and angled nozzle combinations. GRA

N82-26303# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.

COMBUSTION BEHAVIOR OF SOLID FUEL RAMJETS. VOLUME 2: EFFECTS OF FUEL PROPERTIES AND FUEL-AIR MIXING ON COMBUSTION EFFICIENCY Final Report

Aug. 1981 54 p refs
(AD-A110796; NPS67-81-011) Avail: NTIS HC A04/MF A01 CSCL 21/5

Fundamental SFRJ fuel properties were determined using a DTA and a gas chromatograph for both high and low heating rates. The performance of these fuels was then measured under various operating conditions and test geometries. Fuel properties were found to have some effect on the obtainable combustion efficiency but much larger effects could be induced by the flow conditions (induced mixing near the fuel surface, bypass air, etc.). Author (GRA)

N82-26304# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

AN EXPERIMENTAL STUDY OF RECTANGULAR AND CIRCULAR THRUST AUGMENTING EJECTORS M.S. Thesis

Gregory Unnever Dec. 1981 74 p refs
(AD-A111110; AFIT/GAE/AA/81D-31) Avail: NTIS HC A04/MF A01 CSCL 20/4

A short rectangular ejector and two circular ejectors were tested to determine the effects of primary nozzle configuration and geometry on thrust augmentation. The primary nozzle configurations consisted primarily of slot nozzles which injected fluid parallel to the diffuser walls and achieved Coanda type flow at the throat. Results of the rectangular ejector tests indicate that thin plates installed in the mixing chamber or the diffuser, increase mixing but decrease thrust augmentation. A continuous slot nozzle, modified to create four discrete jets at the inlet, improved mixing and thrust augmentation compared to the original design. Thrust augmentation ratio increased from 1.4 to 1.58. The circular ejector primary nozzles consisted of a continuous slot 'torus' nozzle and individual slot nozzles which could be symmetrically placed around the inlet periphery. A nozzle configuration using 16 slot nozzles on the periphery of the inlet face gave the best performance. A thrust augmentation ratio of 2.0 was achieved. GRA

N82-26305# Army Materials and Mechanics Research Center, Watertown, Mass.

MECHANICAL WEAR ASSESSMENT OF HELICOPTER ENGINES BY FERROGRAPHY Final Report

Charles P. Merhib, Samuel J. Acquaviva, and Robert W. Ladner Nov. 1981 24 p ref
(AD-A110772; AMMRC-TR-81-55) Avail: NTIS HC A02/MF A01 CSCL 21/5

Two Ferrography analyzers, an analytical or laboratory Ferrograph and an On-Line (quasi-real-time) Ferrograph, were evaluated. The analytical Ferrograph was found to be an effective supplement to the spectrometric oil analysis program (SOAP) since the Ferrograph analyzes particles in the range of 1 to over 100 microns while SOAP analyzes particles below 5 microns in size. Comments are also offered on a third analyzer, the Direct Reading (DR) Ferrograph. To evaluate the analytical Ferrograph, oil samples from helicopters at Fort Devens, Massachusetts, were analyzed. One transmission was found with excessive wear particles which was later verified by SOAP. The On-Line Ferrograph was tested in 410 hours of operation using a T53-L-13B helicopter engine in a test cell at the Corpus Christi Army Depot. After determining baseline data for the engine, defective bearings were substituted to enhance particle wear penetration. The particles subsequently generated were successfully detected by both the On-Line Ferrograph and SOAP. GRA

N82-26306# General Motors Corp., Indianapolis, Ind.
AERODYNAMICALLY INDUCED VIBRATION Interim Report, 1 Jun. 1980 - 31 Jul. 1981
Robert L. Jay and James L. Bettner Sep. 1981 128 p
(Contract F49620-80-C-0078; AF Proj. 2307)
(AD-A110493; DDA-EDR-10840) Avail: NTIS HC A07/MF A01 CSCL 21/5

An experimental investigation, performed in a large scale low-speed, single-stage compressor, was conducted to provide the radial and chordwise distribution of basic unsteady pressure data on the stator. Radial and circumferential distributions of streamwise and transverse velocity fluctuations were determined at stations upstream, inside and immediately downstream of the stator. Analysis of the results indicated a correlation of the normalized transverse fluctuation velocity component with stator incidence angle. The fluctuations were very large in the endwall regions and were attributed to poor flow conditions generated in the hub and tip endwall regions of the rotor. GRA

N82-26307# Massachusetts Inst. of Tech., Cambridge. Gas Turbine Lab.
HEAT TRANSFER IN TURBINES Final Report, 1 Jan. 1976 - 31 Dec. 1980
Jean F. Louis Wright-Patterson AFB, Ohio AFWAL Oct. 1981 118 p refs
(Contract F33615-76-C-2018; AF Proj. 3056)
(AD-A111584; AFWAL-TR-81-2099) Avail: NTIS HC A06/MF A01 CSCL 21/5

This report summarizes the studies in heat transfer and film cooling effectiveness performed under Contract F33615-76-C-2018. The purpose of these experimental and theoretical studies is to develop an indepth understanding of heat transfer and film cooling in gas turbines. A common experimental procedure is described for heat transfer measurements under isothermal wall conditions using fast response heat transfer gauges in tests conducted in a shock tunnel and a blowdown facility. The tests were conducted at flow and thermodynamic conditions modeling the operating conditions of advanced gas turbines. The configuration under study were single slot, single line of holes, double row of holes on a flat and curved plates, and double lines on an airfoil located in a cascade. The experimental technique was validated by long duration high temperature tests of an air cooled flat plate. Also described is an analytical study of the thermal and fluid mechanical evolution of a cooling film injected from a single line of inclined holes. Author (GRA)

N82-26308# Naval Postgraduate School, Monterey, Calif. Dept of Aeronautics.
BLADE TIP GAP EFFECTS IN TURBOMACHINES: A REVIEW Final Report, 1 Oct. - 30 Sep. 1980
Roy E. Peacock Nov. 1981 103 p refs
(AD-A111892; NPS67-81-016) Avail: NTIS HC A06/MF A01 CSCL 21/5

A review is presented of experiments examining the effects of blade tip gaps encountered in turbomachines and the methods by which the synthesised data are currently used in turbomachinery design and performance analysis. Data gained since the 1930's is subdivided for convenience into diffusing, or compressor-type flows, and accelerating, or turbine-type flows. There is a further sub-division into cascade and rotating machinery data. The overall trend university is that an increasing tip gap whose effect can reach over most or all of the blade height brings reduced overall performance of a turbomachine. Turbine data are in general more regular than the body of compressor data, possibly due in part to the enhanced effect of, usually, undefined boundary layers in diffusing flow. There is some evidence among the compressor and compressor cascade data that an optimum gap exists when the opposing effects of secondary flows, and tip leakage with rotor/wall relative movement tend to balance. Comment is made upon the prediction and design models published in the literature. Author (GRA)

N82-26309# Pratt and Whitney Aircraft Group, West Palm Beach, Fla.
LIFE AND UTILIZATION CRITERIA IDENTIFICATION IN DESIGN (LUCID), VOLUME 1 Final Report, Aug. 1978 - May 1981
J. G. Osmer and C. C. Dietrick Wright-Patterson AFB, Ohio AFWAL Oct. 1981 175 p 2 Vol.
(Contract F33615-78-C-2032; AF Proj. 3066)
(AD-A111939; PWA-FR-14961-Vol-1; AFWAL-TR-81-2101-Vol-1) Avail: NTIS HC A08/MF A01 CSCL 21/5

A methodology for quantifying relative life/performance trades during the conceptual design phase of gas turbine engine development is presented. As part of this methodology, a computer aided design system employing regression techniques was developed and demonstrated. Major elements of this system are performing satisfactorily, however, certain component subroutines are exhibiting unacceptable error levels. Further effort is required in this innovative application of standard regression techniques. GRA

N82-26310# Pratt and Whitney Aircraft Group, West Palm Beach, Fla.
LIFE AND UTILIZATION CRITERIA IDENTIFICATION IN DESIGN (LUCID), VOLUME 2 Final Report, Aug. 1978 - Mar. 1981
J. G. Osmer and C. C. Dietrick Wright-Patterson AFB, Ohio AFWAL Oct. 1981 117 p refs 2 Vol.
(Contract F33615-78-C-2032; AF Proj. 3066)
(AD-A111940; AFWAL-TR-81-2101-Vol-2) Avail: NTIS HC A06/MF A01 CSCL 21/5

Procedures for predicting gas turbine engine usage are presented. Peacetime missions were defined for an advanced tactical strike aircraft and were employed by the usage models to generate a composite engine duty cycle. The engine duty cycle was analyzed and compared to engine usage projections for other advanced tactical aircraft. The analysis demonstrated significant variations in engine usage due to weapon delivery tactics associated with advanced air to surface missiles, as well as variations in peacetime mission frequencies and aircraft performance. GRA

N82-26311# Boeing Military Airplane Development, Seattle, Wash.
CURRENT STATUS OF INLET FLOW PREDICTION METHODS
Gerald C. Paynter 14 May 1981 36 p refs
(AD-A111784) Avail: NTIS HC A03/MF A01 CSCL 21/5

The increasing availability of large computers, advances in numerical fluid mechanics, and the rapidly escalating cost of wind tunnel testing are responsible for a trend toward the use of parametric analysis rather than parametric testing to support the design of inlet systems. With an emphasis on the transonic and supersonic speed regimes, current approaches to inlet flow analysis are discussed in the context of the inlet design process. Results from typical procedures now under development for supersonic inlet flows are presented along with a discussion of the advantages and disadvantages of each for design. The requirements for experimental validation of a procedure and analysis problem areas are reviewed. Recent developments which may lead to an improved inlet flow analysis capability are discussed. Author (GRA)

N82-26312# Monsanto Research Corp., Dayton, Ohio.
TURBINE ENGINE LUBRICANT RECLAMATION Interim Report, 1 Sep. 1979 - 1 Feb. 1981
George L. Beemsterboer and Richard J. Bruns Wright-Patterson AFB, Ohio AFWAL Dec. 1981 132 p refs refs HC A06/MF A01
(Contract F33615-79-C-2052; AF Proj. 3048)
(AD-A112098; MRC-DA-1057; AFWAL-TR-81-2053) Avail: NTIS CSCL 11/8

A distillation and adsorption treatment for reclaiming used MIL-L-7808 turbine oils was investigated. A viable additive package was tested on different MIL-L-7808 type virgin base stocks. Fifteen used oils were analyzed by acid number, high performance liquid chromatography, and gas chromatography. A distillation process utilizing caustic (sodium hydroxide) pretreatment was developed on 500-ml and 13-litre scales. Adsorption treatment of distilled oils with calcium hydroxide followed by attapulgus clay was examined. Preparations for large-scale (25 and 250 gal) reclamations are currently under way to elucidate the validity of caustic distillation and absorbent treatment parameters. Author (GRA)

N82-26313# Rensselaer Polytechnic Inst., Troy, N. Y. School of Engineering and Applied Science.

field are discussed. The procedure chosen combines the consistency of the Tscherning-Rapp model with the advantages of a formulation in terms of Gauss-Markov processes by making use of the essential parameters of a covariance function proposed by Moritz. The expressions for the gravity induced position errors resulting from this approach are easy to compute for a wide variety of cases. The assumptions made to derive them are in general justifiable. Based on the available gravity field information a number of approximation models are proposed and expressed in terms of equivalent spherical harmonic expansions. Results show that the use of presently available global models would reduce the gravity induced position errors from Sigma = 150 m. Improved global models expected in the near future as for instance those from the GRAVSAT mission, would bring errors below Sigma = 50 m. GRA

N82-27273# Army Missile Command, Redstone Arsenal, Ala. Systems Simulation and Development Directorate.
QUASILINEARIZATION SOLUTION OF THE PROPORTIONAL NAVIGATION PROBLEM
Dale W. Alspaugh (Purdue Univ., West Lafayette, Ind.) and Maurice M. Hallum, III Jun. 1981 24 p refs
(DA Proj. 1L1-62302-A-214)
(AD-A113668; AD-E950227; DRSMI/RD-81-15-TR) Avail: NTIS HC A02/MF A01 CSCL 17/7

An approximate solution is presented in this report for the trajectory of a constant-speed missile following a planar intercept trajectory based on proportional navigation guidance. The technique of quasilinearization is used to generate a sequence of solutions. An explicit solution is developed using the first recursive solution. The accuracy of this solution is discussed in the context of specific sets of parameters. It is shown that this explicit solution provides excellent accuracy over a wide range of intercept trajectories. Author (GRA)

N82-27274# Naval Surface Weapons Center, Dahlgren, Va. Strategic Systems Dept.
DOPPLER TEST RESULTS OF EXPERIMENTAL GPS RECEIVER Final Report
Richard J. Anderle Jan. 1982 64 p refs
(AD-A113587; NSWC/TR-82-01) Avail: NTIS HC A04/MF A01 CSCL 08/5

Three experimental geodetic Global Positioning System Receivers were deployed in the Washington, D. C. area. Analysis of five to six hours of Doppler observations distributed among four satellites yielded relative position coordinates on a 28 km baseline which were repeatable to 30 cm in height, 70 cm in the East directions and to 10 cm in the North directions. Results obtained for a receiver equipped with an oscillator having poorer stability degraded to 50 cm to 1.5 meters. The results confirm simulations that Doppler observations made with the geodetic receiver under development will yield decimeter accuracy in relative position in one to three hours. Since the experimental receivers required about a minute to sequence between satellites, tests could not be performed to test cm precision in relative station positioning which can be obtained by comparing phase observations between satellites with receivers under development. GRA

N82-27275# Naval Coastal Systems Center, Panama City, Fla. Mine Countermeasures Development Div.
A BALANCED ACTIVE ANTENNA AND IMPULSE NOISE BLANKET SYSTEM FOR THE REYDIST T RADIO NAVIGATION RECEIVER
Bobby R. Ludlum Feb. 1982 32 p
(AD-A114074; AD-F200023; NCSC-TM-340-82) Avail: NTIS HC A03/MF A01 CSCL 17/7

Erratic operation of Raydist T radio navigation equipment aboard mine countermeasures helicopters has been traced to fuselage-tow cable interactions with the Raydist receiving antenna and to negative-corona generated impulse noise. The development of a balanced active antenna and an impulse noise blanker which have proved successful in reducing these detrimental effects are described. The final system is described in detail and the results of laboratory tests are presented. Author (GRA)

N82-27276# Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEM (METCALS) INVESTIGATION Final Report
Robert N. Trebits, Eric S. Stoberg, Raymond B. Efurd, Benjamin Perry, and Mark A. Corbin Feb. 1982 172 p refs
(Contract N00039-80-C-0082)
(AD-A113047; GIT/EES-A-2550-FTR) Avail: NTIS HC A08/MF A01 CSCL 17/7

A television tracker system for the AN/TPN-22 radar was designed, assembled, and delivered. A cursor whose position is determined by the radar's tracking solution is superimposed on a TV camera image of the aircraft on its landing approach. Alphanumeric data also appear on the display for video tape documentation purposes. Author (GRA)

N82-27277# Mitre Corp., McLean, Va. METREK Div.
THE FLIGHT SERVICE AUTOMATION SYSTEM (FSAS) SYSTEM BENCHMARK. VOLUME 1: SUMMARY, INTRODUCTION AND CONCEPTS
R. G. Nystrom, S. Koslow, and C. R. Spooner Aug. 1981 80 p 4 Vol.
(Contract DTFA01-81-C-10001)
(PB82-143538; MTR-81W131-Vol-1) Avail: NTIS HC A05/MF A01 CSCL 01B

A system benchmarking technology was developed to meet the requirements of an interactive, dedicated application. This methodology is applicable to procurements in which the hardware/operating system configurations are off the shelf and the applications software was not implemented in its eventual form. In this methodology, a model of the application is interfaced with the operating system and is executed, while being driven by a specified load, and performance of the proposed configuration is measured. The requirements of the FSAS application of this system benchmark methodology was documented and is published in the present form to record and the concepts and techniques of the methodology are made available. GRA

N82-27278# Mitre Corp., McLean, Va. METREK Div.
THE FLIGHT SERVICE AUTOMATION SYSTEM (FSAS) SYSTEM BENCHMARK. VOLUME 2: THE MODEL OF THE APPLICATION
C. R. Spooner Aug. 1981 344 p 4 Vol.
(Contract DTFA01-81-C-10001)
(PB82-143546; MTR-81W131-Vol-2) Avail: NTIS HC A15/MF A01 CSCL 01B

Application of a system benchmarking technology is illustrated. The model of the application is described and requirements and guidelines for mapping the model to the proposed configurations, and for selection of options in the model are provided. GRA

N82-27279# Mitre Corp., McLean, Va. METREK Div.
THE FLIGHT SERVICE AUTOMATION SYSTEM (FSAS) SYSTEM BENCHMARK. VOLUME 3: THE VENDOR INTERFACE PACKAGE
C. R. Spooner Aug. 1981 175 p 4 Vol.
(Contract DTFA01-81-C-10001)
(PB82-143553; MTR-81W131-Vol-3) Avail: NTIS HC A08/MF A01 CSCL 01B

The Vendor Interface Package (VIP) for th FSAS system is presented. It provides a standard interface for the model with the proposed system. The VIP requirements and implementation guidelines are given. GRA

N82-27280*# Operations Research, Inc., Silver Spring, Md.
BENEFIT COST ANALYSIS OF THE AIRCRAFT ENERGY EFFICIENCY PROGRAM Final Report
James Bauchspies, Frank Hopkins, and Lawrence Kaplan Nov. 1980 242 p refs Revised
(Contract NASw-2961)
(NASA-CR-169116; NAS 1.26:169116) Avail: NTIS HC A11/MF A01 CSCL 01C

Analyses were reviewed in light of rapid and dramatic changes in fuel cost and availability, as well as significant changes in the economic and political climate relating to these factors. N.W.

N82-27281# Boeing Commercial Airplane Co., Seattle, Wash. Noise Technology Dept.
AIRCRAFT NOISE REDUCTION
Richard E. Russell and J. M. Streckenbach 1981 15 p Presented at the Intern. Symp. on Transportation Noise, Pretoria, 21-23 Oct. 1981
Avail: NTIS HC A02/MF A01

A brief introduction of the Boeing commercial airliner family is followed by a discussion of the significant noise reduction accomplishments for turbine-powered aircraft from the 1950's to the 1980's, with projections of further benefits until the year 2000. Definition of the trades to be made between noise reduction and fuel economy, as well as technical problems yet unsolved, lead to a recognition that the greatest advances in aircraft noise reduction are past, and that significant research will be required in the future to lower noise floors that are presently inhibiting further progress. Emphasis is given to precautions that must be taken in the selection of meaningful fleet noise data to avoid costly and irreversible errors in airport and community planning. T.M.

N82-27282# United Technologies Corp., Stratford, Conn. Sikorsky Aircraft Div.

XH-59A ABC TECHNOLOGY DEMONSTRATOR ALTITUDE EXPANSION AND OPERATIONAL TESTS Final Report, Aug. 1980 - Jun. 1981

A. J. Ruddell Dec. 1981 79 p refs
(Contract DAAK51-80-C-0021; DA Proj. 1L1-62209-AH-76)
(AD-A111114; SER-69072; USAAVRADCOM-TR-81-D-35)
Avail: NTIS HC A05/MF A01 CSCL 01/3

This report presents the results of two flight test programs conducted with the XH-59A Advancing Blade Concept demonstra- configuration, consisted of altitude and center-of-gravity envelope expansion testing. Test results verified the concept of ope expansion testing. Test results verified the concept of developing lift primarily on the advancing rotor blades to dramatically improve lift and speed potential. The XH-59A achieved a maximum speed of 263 knots true airspeed and demonstrated a service ceiling of 25,500 feet. The entire flight envelope was demonstrated without classical retreating blade stall. Rotor loads and stresses and rotor tip clearance followed predicted trends and were controllable. Limited center-of-gravity envelope expansion was accomplished. The second program consisted of operational tests conducted primarily in the nap-of-the-earth and contour flight environments, using both the auxiliary and helicopter propulsion modes. The compact ABC design and smaller rotor diameter enhanced operation in confined areas. Operational test results showed the ABC to be a viable alternative concept for future tactical aircraft. GRA

N82-27283# Army Logistics Evaluation Agency, Cumberland, Pa.

AVIATION MATERIEL COMBAT READY IN-COUNTRY (AMCRIC)

Herman M. Orrell, III Jun. 1981 58 p refs
(AD-A107451) Avail: NTIS HC A04/MF A01 CSCL 15/5

A previous study, titled Aviation Materiel Combat Ready In-Country (AMCRIC), was provided as a basis to develop a concept to preposition Army aircraft in US Army Europe. This study recognized that aircraft are not authorized as war reserve, and that no aircraft are currently included in POMCUS in Europe. To adequately reinforce NATO, some method had to be devised to allow Army aircraft to be immediately available to a deploying combat force. The project considered: (a) Methods available to accomplish prepositioning of Army helicopters and ancillary systems; (b) South Vietnam Army aviation experience in combat; (c) State-of-the-art storage methods by US Government, foreign governments, and commercial contractors; and (d) Major command interfaces within the US Army that will be required to establish a workable concept. The project results were that US Army has the capability to store helicopters for short periods using on-hand resources; and The Vice Chief of Staff, Army, approved a prepositioning concept developed which will store helicopters in USAREUR on a test bed basis using AH-1S helicopters. GRA

N82-27284# Air Force Geophysics Lab., Henscom AFB, Mass.

RESPONSE OF CLOUD MICROPHYSICAL INSTRUMENTS TO AIRCRAFT ICING CONDITIONS Interim Scientific Report

Morton Glass and Donald D. Grantham 6 Jul. 1981 56 p refs
(AF Proj. 6670)
(AD-A112317; AFGL-TR-81-0192; AFGL-ERP-747) Avail: NTIS HC A04/MF A01 CSCL 01/4

A series of passes on 6 December 1979 through multilayered-supercooled stratiform and stratocumulus clouds by the Air Force Geophysics Laboratory's instrumented C-130E cloud physics research aircraft is used to evaluate a Rosemount Ice Detector. The response of the detector to icing conditions is compared with measurements from a J-W liquid water content meter and the Knollenberg Axial Scattering Spectrometer Probe (ASSP). A procedure to adjust for zero drift of the J-W instrument is developed. Comparison of liquid water measurements from the J-W and from the ASSP indicate that these data are highly correlated and similar in magnitude. A procedure for extracting useful information from the Rosemount Ice detector has been developed. The icing conditions in the cloud systems studied are typical of the range of conditions in winter stratiform clouds. Liquid water (LWC) values of 0.3 g/cu m and median volume diameters of 15 micrometers were most frequently observed. The results of the analysis show that the Rosemount Ice Detector is a sensitive indicator of the fluctuations of liquid water in clouds with LWC not exceeding 0.8 g/cu m -3. Author (GRA)

N82-27285# General Accounting Office, Washington, D. C. Mission and Analysis and Systems Acquisition Div.

REDUCED PERFORMANCE AND INCREASED COST WARRANT REASSESSMENT OF THE MULTIPLE STORES EJECTOR RACK

26 Mar. 1982 6 p refs
(AD-A112776; GAO/MASAD-82-26) Avail: NTIS HC A02/MF A01 CSCL 19/2

The Air Force plans to award a contract in June 1982 for the continued development of an aircraft bomb carrier known as the Multiple Stores Ejector Rack (MSER). The rack, in development since 1976, was intended for use by certain Navy aircraft as well as several aircraft operated by the Air Force. However, we have found that: service interest in a common bomb rack has dwindled and both the Air Force and the Navy are pursuing separate bomb rack developments; some MSER development goals may not be achieved; and other alternatives to MSER have not been fully evaluated; in addition, MSER's estimated development costs have tripled and average unit procurement costs could not be 14 times greater than the cost of the racks now in service; and the development period has more than doubled. The Air Force has basically reduced it MSER requirements to one aircraft, the F-16, and the Navy has all but pulled out of the program. Before authorizing further expenditure of funds for MSER, GAO recommends that the Air Force and Navy Secretaries be required to determine whether a common bomb rack is still needed, whether MSER will meet Air Force and Navy requirements, and whether it is cost effective. GRA

N82-27286# Systems Control, Inc., Palo Alto, Calif.

DEVELOPMENT OF LOW-ORDER MODEL OF AN X-WING AIRCRAFT BY SYSTEM IDENTIFICATION Final Report

James H. Vincent and John W. Bunnell Feb. 1982 103 p refs
(Contract N00014-79-C-0578)
(AD-A113760) Avail: NTIS HC A06/MF A01 CSCL 01/3

The original purpose of this contract was to prepare a flight test plan for the proposed X-wing demonstrator using system identification to extract useful math models from the flight test data. Since the original statement of work was submitted, however, the scope of this study changed. An X-wing program decision has been reached not to carry the Lockheed X-wing configuration to flight test. Therefore, this task was modified to provide a demonstration of the feasibility of using system identification techniques to extract low-order math models from time history data from a detailed X-wing rotor simulation (REXOR). GRA

N82-27287# Transportation Systems Center, Cambridge, Mass.

B-747 VORTEX ALLEVIATION FLIGHT TESTS: GROUND-BASED SENSOR MEASUREMENTS Final Report

D. C. Burnham Jan. 1982 188 p refs
(AD-A113621; DOT-TSC-FAA-81-19; DOT/FAA/RD-81/99)
Avail: NTIS HC A09/MF A01 CSCL 20/4

In 1979, a series of B-747 flight tests were carried out to study the wake-vortex alleviation produced by deploying spoilers in the landing configuration. The alleviation achieved was examined by encounters of probe aircraft and by velocity profile measure- ments made by a ground-based Laser Doppler Velocimeter. For the first time these two types of measurements were analyzed in a way which allowed direct comparison; they showed reasonable agreement. The velocimeter measurements can be used to evaluate the vortex-induced rolling moment on any following aircraft at any separation. The spoiler alleviation was found to be insufficient to assure safe landings of small aircraft at reduced separation behind the B-747. The persistence of the alleviated vortices appears to be due to the wing-tip vortices which dominate the roll-up of the spoiler-alleviated wake. The addition of rapid roll inputs to the spoiler deployment produced much more effective alleviation, but at the expense of an unacceptable ride quality in the generating aircraft. Author (GRA)

N82-27288# Aeronautical Research Inst. of Sweden, Stockholm. Structures Dept.
COMPARISON OF DIFFERENT FIGHTER AIRCRAFT LOAD SPECTRA
Aake Magnusson 1982 16 p refs
(Contract F-INK-82223-77-001-21-001)
(FFA-TN-1982-02) Avail: NTIS HC A02/MF A01

Open hole specimens, made from 3 mm thick aluminum 7075-T6 [3627-48] clad sheet, were subjected to fighter aircraft load spectra. The influence on fatigue life of spectrum variations, e.g., severe negative maneuver loads, maximum load truncation and cycle omission was studied. Six load spectra, including fighter aircraft loading standard for fatigue evaluation (FALSTAFF) and a cycle truncated version of FALSTAFF, containing 9006 cycles per 200 flights, i.e., half the original number, were investigated. Severe negative maneuver loads as well as maximum load truncation reduce the fatigue life. Truncated FALSTAFF produces the same fatigue life as the original sequence. Author (ESA)

N82-27289# Advanced Engineering Lab., Salisbury (Australia).
COMPOSITE FLIGHT TEST BOOM FOR NOMAD N22B AIRCRAFT
N. C. Frost Nov. 1981 20 p refs
(AEL-0086-TM; AR-002-598) Avail: NTIS HC A02/MF A01

The design, analysis and manufacturing processes are described for an instrumentation nose boom for a flight test program on the Nomad aircraft. Author

N82-27290# Naval Ship Research and Development Center, Bethesda, Md. Central Instrumentation Dept.
CORRECTING FOR TURBULENCE EFFECTS ON AVERAGE VELOCITY MEASUREMENTS MADE USING FIVE HOLE SPHERICAL PITOT TUBE PROBES
Robert D. Pierce Feb. 1982 32 p refs
(AD-A112573; DTNSRDC/CID-82/1) Avail: NTIS HC A03/MF A01 CSCL 14/2

A procedure has been developed for correcting five hole spherical pitot tube mean velocity measurements for errors caused by velocity fluctuations associated with turbulent flow. Velocity fluctuations are independently measured with hot film or hot wire anemometers. These data are then applied to expressions derived in this report to accomplish the necessary correction. This procedure applies to the case where the pitot tube responds to average pressure differentials and is not oriented to null the cross velocity components. For the special case of isotropic flow, the results derived in this report show that corrections are not required. Author (GRA)

N82-27291# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
COCKPIT DISPLAY OF TRAFFIC INFORMATION AND THE MEASUREMENT OF PILOT WORKLOAD: AN ANNOTATED BIBLIOGRAPHY Final Report, 1970 - 1982
Jacqueline T. Rehmann Feb. 1982 62 p
(AD-A113637; DOT/FAA/CT-81/49; DOT/FAA/EM-81/9) Avail: NTIS HC A04/MF A01 CSCL 01/3

Approximately 80 references relating to pilot workload were selected and summarized as part of the Cockpit Display of Traffic Information (CDTI) studies currently being conducted by the Federal Aviation Administration Technical Center in Atlantic City, New Jersey. A comprehensive search of the scientific literature was conducted using several sources, including books, scientific journals, proceedings of technical meetings, and computerized information retrieval. Specific topics covered on this annotated bibliography, as they related to CDTI and its concomitant workload considerations, are subjective measures, spare mental capacity, primary task measures, and physiological measures. Author (GRA)

N82-27292# AOA Apparatebau Gauting G.m.b.H. (West Germany).
TORSIONAL STIFFNESS ELEMENT BASED ON COBALT-SAMARIUM MAGNETS Final Report
Reiner Osthermayer Bonn Bundesministerium fuer Forschung und Technologie Dec. 1981 70 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-W-81-044; ISSN-0170-1339; Rept-4.1.0032) Avail: NTIS HC A04/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 14,70

The feasibility of a strapdown turn and bank indicator with an electromagnetic torsional stiffness element based on cobalt samarium permanent magnets was investigated. Characterization of the suitability of this magnetic material in fulfilling design requirements was stressed. Theoretical fundamentals for the tailoring of magnetic heads were reviewed. Cobalt samarium disks were magnetized axially in such a way that over a range of 18 deg a linear relationship between magnetic induction and the axial deviation angle exists. With these magnets, electromagnetic torsional stiffness elements were built in which the torsion constant is adjustable by the current. Alternative torsional stiffness elements with constant magnetization, but specific profiling of the magnets as well as magnets in connection with a specific current were also studied on a model for dynamic applications. Results validate the mechanical torsional stiffness element design and confirm the magnetic properties of cobalt samarium. Author (ESA)

N82-27293# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
IMPACT OF ADVANCED AVIONICS TECHNOLOGY AND GROUND ATTACK WEAPON SYSTEMS
Feb. 1982 147 p refs Meeting held at Agheos-Andreas, Greece, 19-23 Oct. 1981
(AGARD-CP-306; ISBN-92-835-0310-4) Avail: NTIS HC A07/MF A01

Autonomous operations conducted by day, night, and in adverse weather are associated with a high degree of automation, requiring sensors with high performance and a large data and signal processing capacity. The vulnerability of attack aircraft to the ground to air defense and the excessive workload of the pilot in the guidance of air to ground weapons point to the concept of a generation of fire and forget weapons.

N82-27294# Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Deputy for Avionics Control.
IMPACT OF ADVANCED AVIONICS AND MUNITIONS TECHNOLOGY ON GROUND ATTACK WEAPONS SYSTEMS IN NIGHT AND ADVERSE WEATHER CONDITIONS
Louis J. Urban *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 4 p (For primary document see N82-27293 18-06)
Avail: NTIS HC A07/MF A01

Worldwide environmental conditions that may be encountered by fighter pilots are reviewed as well as the capabilities of potential adversaries. Technology efforts and systems developed to improve capability to operate at night and under unfavorable weather conditions discussed include advanced medium range air-to-air missiles, the PAVE TACK system used on the F-4 and F-111 aircraft, and the low altitude navigation and targeting infrared system for night (LANTIRN) which assists the pilot of a single seat aircraft to fly under the weather in night and helps in acquiring targets and readying weapons for launch. To complement LANTIRN, high resolution synthetic aperture tactical radar and millimeter wave radars are under development to improve target recognition, resolution, and navigation. The precision location strike system, imaging infrared Maverick, combined effects bomblets, GATOR air delivered mines, and wide area antiarmor munitions are other developments summarized. A.R.H.

N82-27295# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
AIR-GROUND ATTACK: AXES OF RESEARCH FOR AIRBORNE SYSTEMS [ATTAQUE AIR-SOL: AXES DE RECHERCHE POUR LES SYSTEMES AEROPORTES]
S. Croce-Spinelli *In its* Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 14 p In FRENCH (For primary document see N82-27293 18-06)
Avail: NTIS HC A07/MF A01

The integration of weapons systems with other airborne systems and equipment is considered from the point of view of operational aspects. Various weapons and their fire control characteristics are classed and the requirements and possibilities offered for meeting them are tabulated. Target acquisition, mission constraints, and versatility of mission are examined. Strapdown inertial guidance, radio altimeters, radar maps, electro-optics, and multiple access transmission networks are discussed. Systems for very low altitude flight and threat evaluation are described. Transl. by A.R.H.

N82-27296# British Aerospace Aircraft Group, Kingston-upon-Thames (England).
SOME POTENTIAL NOVEL APPROACHES TO THE AUTOMATIC AIRBORNE DETECTION AND IDENTIFICATION OF GROUND TARGETS
J. S. Williams *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 13 p refs

Avail: NTIS HC A07/MF A01
Basic sensor processing functions are examined in an effort to establish the type of operation to be conducted optically. If optical techniques are to be used in target detection and identification, interfaces must be minimized in order to reduce the size of the device used, improve reliability and inspectability, and conserve signal power during processing. Topics covered include receiving optics, optical signal decomposition, image preprocessing, display prepreparation, acquisition computation, and range and bearing. Coherent transform optics, holographic methods, optical feedback, real-time processing, and optical bistable devices are discussed as processing elements. Although optical signal processing has considerable potential in airborne target recognition, considerable research is needed in this capability is to be realized. There is a need to support this activity with adequate modelling of the perception capability of the human visual system if information is to properly displayed and then utilized. A.R.H.

N82-27297# National Aerospace Lab., Amsterdam (Netherlands).
A PLANNING SYSTEM FOR F-16 AIR-TO-SURFACE MISSIONS
P. J. M. Urlings, W. Loeve, and J. Batenburg (Royal Netherlands Air Force, Zeist) *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 6 p refs

Avail: NTIS HC A07/MF A01
Recently introduced into the Royal Netherlands Air Force, the F-16 aircraft is to be employed in both air-to-air and air-to-surface operations. Successful air-to-surface mission accomplishment is highly dependent on the avionics system capabilities as navigation, target acquisition, fire control, and weapons delivery. To make use of the full avionic potential, the set-up of its systems requires careful planning and preflight preparation. Checklists must also be prepared for navigation and in-flight system operation. A concept for a mission planning system is presented to provide the F-16 pilot with a tool for performing adequate preparation. Specific F-16 avionic demands on mission planning are summarized and two systems related to this planning are described. The assembling of F-16 in-flight essentials into a combat mission folder is described. A.R.H.

N82-27298# Hughes Aircraft Co., El Segundo, Calif. Advanced Programs Lab.
PAVE MOVER AIDED INTEGRATED STRIKE AVIONICS SYSTEM
A. J. Mendez, T. A. DuPuis (AFWAL), and J. Boaz *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 6 p refs

Avail: NTIS HC A07/MF A01
Methods were developed for specifying targeting sensor performance based on tactics and weapons characteristics alone. Targeting sensor specifications (demand curves) developed in this manner indicate that, for quick reaction, short range attack with precision-guided munitions, single sensors do not generate sufficient confidence (supply curves) to satisfy the required timeliness. This problem is alleviated by treating all sensors as an integrated set - the ISAS concept. New tactics produce sudden encounters which do not always yield a favorable attack geometry, even if the ISAS is able to distinguish the high priority targets in its field of regard. This situation is greatly improved by real-time targeting data from a stand off target acquisition/control system such as Pave Mover. Maximum benefit from the new tactics and weapon delivery concepts is accrued by pairing the complementary capabilities of ISAS and Pave Mover. This combination optimizes the strike effectiveness and survivability of ground attack aircraft which must penetrate to the battlefield and deep interdiction regions. A.R.H.

N82-27299# AEG-Telefunken, Ulm (West Germany).
ADAPTIVE MULTIFUNCTION SENSOR CONCEPT FOR AIR-GROUND MISSIONS
R. P. Mills-Goodlet, D. J. R. Stock, E. G. Woelfle, and C. Hamilton *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 15 p refs

Avail: NTIS HC A07/MF A01
The requirements imposed on a radar system it is to be installed in aircraft flying low-level interdiction missions are discussed. A typical low low-level air-ground attack scenario is described together with the various radar techniques and modes that must be employed. Particular attention is given to the nose radar, its antenna, and its integration with other aircraft sensors to form an adaptive multisensor system. The ways in which such a multisensor system can reduce pilot workload are examined. A.R.H.

N82-27300# Naval Air Systems Command, Washington, D. C.
ATTACK AND EN ROUTE AVIONICS FOR IN-WEATHER OPERATIONS
E. B. Beggs, W. F. Ball (Naval Weapons Center, China Lake, Calif.), and N. J. Schneider (Naval Weapons Center, China Lake, Calif.) *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 11 p

Avail: NTIS HC A07/MF A01
An increasingly sophisticated and lethal ground threat environment must be countered in large part by technological advances in the avionics of naval attack aircraft. Critical deficiencies exist in the areas of standoff targeting and weapon delivery, defense suppression, equipment reliability, and crew loading. To reduce pilot workload, automated procedures and decision aids must be developed. Technology must be made available for precise navigation, integration of weapon delivery and flight control systems, automatic target recognition, detection avoidance, automatic flight path routing, and secure communications. The ingress and egress phases of naval air missions are discussed as well as the attack phase and defense suppression. Author

N82-27301# Electronique Marcel Dassault, St. Cloud (France).
WEAPON SYSTEM OF A FUTURE ATTACK AIRCRAFT [SYSTEME D'ARME D'UN AVION D'ATTAQUE FUTUR]
B. E. Bortomb *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 11 p refs In FRENCH
Avail: NTIS HC A07/MF A01
A hypothetical all-weather air-to-surface weapon system is presented which is adaptable to a single seat aircraft whose weight without armor would be on the order of 4 tons. It would appear that this system requires a precise predesignation of objectives, so that it can than fulfill its mission with good chances of success by day as well as by night; through diverse fogs and relatively important precipitation, conditions which cover 99% of the cases in which it is used. Transl. by A.R.H.

N82-27302# British Aerospace Public Ltd. Co., Preston (England).
ADVANCED TECHNOLOGY AND FIGHTER COCKPIT DESIGN: WHICH DRIVES WHICH?
I. E. Schofield *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 10 p

Avail: NTIS HC A07/MF A01
Problems experienced by the ground attack fighter pilot are reviewed, and the design of an acceptable man machine interface in the cockpit in order to ensure maximum head up operation for low level flying is discussed. The present use of automation and CRT displays is reviewed. Problems in the employment of increased automation, direct voice input, and synthetic speech, and their integration into the avionics system are considered. The use of multifunction displays and controls, keyboards, and the more traditional switchery is discussed. J.D.

N82-27303# Army Armament Research and Development Command, Dover, N. J.
DIGITAL IMAGE PROCESSING FOR ACQUISITION, TRACKING, HAND OFF AND RANGING
Robert R. Marinellie and John V. Spangler *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 12 p refs

Avail: NTIS HC A07/MF A01
The design, application, and preliminary analysis of flight test results of the AUTO-Q digital image processor for the automatic recognition of targets in reconnaissance images are

A floating-point/multiple-precision processor for airborne applications
[NASA-TM-84252] N82-26289
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[AD-A107139] N82-27269
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N82-27298

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Listing of aircraft accidents/incidents by make and model, U.S. civil aviation, 1979
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[PB82-134339] N82-27253
Briefs of fatal accidents involving fixed-wing multi-engine aircraft, U.S. General Aviation, 1979
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[PB82-138991] N82-27255
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[PB82-138983] N82-27256
Briefs of accidents involving amateur/home built aircraft, U.S. general aviation, 1979
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Briefs of accidents involving gliders, U.S. general aviation, 1979
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The DRAPO system - Materials means and logic functions A82-37521
Steady, Oscillatory, and Unsteady Subsonic and Supersonic Aerodynamics, production version 1.1 (SOUSSA-P1.1). Volume 2: User/programmer manual. Addendum 1: Analytical treatment of wake influence [NASA-TM-84404] N82-26236

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Strategic materials - Technological trends A82-37972

LOGISTICS MANAGEMENT
Opportunities exist to achieve greater standardization of aircraft and helicopter seats [AD-A111718] N82-26259

discussed. The problems of information extraction from and bandwidth reduction in raw sensor data and the way they lead to the evolution of a common preprocessing approach are considered. The image processing tasks involved in target acquisition, tracking, and handoff are described. The basic concepts and algorithms in AUTO-Q are presented, and the volution of three generations of digital hardware described. A description of the electrical and mechanical characteristics of the latest system is presented. J.D.

N82-27304# Marconi Avionics Ltd., Rochester (England). Airborne Display Div.
WIDE ANGLE RASTER HEAD UP DISPLAY DESIGN AND APPLICATION TO FUTURE SINGLE SEAT FIGHTERS
David W. Hussey *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 8 p refs

Avail: NTIS HC A07/MF A01

Unconventional optical design capable of the largest practical field of view, around 20 degrees by 30 degrees for the majority of existing fighter cockpits are described. Some auxiliary advantages implicit in the designs are also outlined. Head up displays of this type are currently in development for the USAF LANTIRN program to be flown in the F-16 and A-10. They are also compatible with a wide range of other fighter aircraft. J.D.

N82-27305# Army Night Vision Lab., Fort Belvoir, Va.
ADVANCED TARGET ACQUISITION AND TRACKING CONCEPTS FOR REAL TIME APPLICATIONS
John Thomas Hall *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 7 p refs

Avail: NTIS HC A07/MF A01

The basic functional requirements for the target acquisition mission based on the sensor input, preprocessing, image segmentation, feature extraction, target detection, and target classification operations are presented. The impact on designing real time tracking algorithms to follow targets through clutter is considered. An advanced tracking concept considering the coupling of the target detection/classification algorithm with the multimode track is discussed. The thrust for multisensor systems is considered from the synergistic target acquisition point of view. The implementation of smart sensor target acquisition functions is presently limited by hardware capabilities. The advancement in the very high speed dedicated integrated circuit technology will make present advanced algorithms realizable in integrated circuit hardware. The projected needs for real time target acquisition and tracking are considered for the autonomous vehicle. Several approaches are considered for realization of the truly real time target acquisition system in the next decade. J.D.

N82-27306# Rome Air Development Center, Griffiss AFB, N.Y.
TACTICAL SYSTEMS APPROACH TO INTERDICTION OF 2ND ECHELON MOVING TARGETS USING REAL TIME SENSORS
Martin J. Biancalana and Henry J. Mancini (GE, Utica, N.Y.) *In* AGARD Impact of Advan. Avionics Technol. on Ground Attack Weapon Systems Feb. 1982 9 p refs

Avail: NTIS HC A07/MF A01

An integrated system architecture for the effective interdiction of second echelon ground forces which are advancing under the cover of intense EW and air defense protection is described. The proposed architecture is based on principles derived from control theory and present practice, and includes the use of advanced air to surface and surface to surface quasi-autonomous attack elements operating in a complementary manner with stand off target acquisition and track sensors. All of the necessary elements of such an advanced architecture are in fact in various stages of development today. Author

N82-27309*# Pratt and Whitney Aircraft Group, East Hartford, Conn.
PERFORMANCE DETERIORATION DUE TO ACCEPTANCE TESTING AND FLIGHT LOADS; JT90 JET ENGINE DIAGNOSTIC PROGRAM
W. J. Olsson 22 Jan. 1982 147 p refs
(Contract NAS3-20632)
(NASA-CR-165572; NAS 1.26:165572; PWA-5512-87) Avail: NTIS HC A07/MF A01 CSCL 21E

The results of a flight loads test of the JT9D-7 engine are presented. The goals of this test program were to: measure aerodynamic and inertia loads on the engine during flight, explore the effects of airplane gross weight and typical maneuvers on these flight loads, simultaneously measure the changes in engine running clearances and performance resulting from the maneuvers, make refinements of engine performance deterioration prediction models based on analytical results of the tests, and make recommendations to improve propulsion system performance retention. The test program included a typical production airplane acceptance test plus additional flights and maneuvers to encompass the range of flight loads in revenue service. The test results indicated that aerodynamic loads, primarily at take-off, were the major cause of rub-indicated that aerodynamic loads, primarily at take-off, were the major cause of rub-induced deterioration in the cold section of the engine Differential thermal expansion between rotating and static parts plus aerodynamic loads combined to cause blade-to-seal rubs in the turbine. B.W.

N82-27310*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Business Group.
CORE COMPRESSOR EXIT STAGE STUDY, VOLUME 6 Final Report, Oct. 1976 - Dec. 1981
D. C. Wisler Dec. 1981 97 p refs
(Contract NAS3-20070)
(NASA-CR-165554; NAS 1.26:165554; GE-R81AEG288) Avail: NTIS HC A05/MF A01 CSCL 21E

Rear stage blading designs that have lower losses in their endwall boundary layer regions were studied. A baseline Stage A was designed as a low-speed model of stage 7 of a 10-stage compressor. Candidate rotors and stators were designed which have the potential of reducing endwall losses relative to the baseline. Rotor B uses a type of meanline in the tip region that unloads the leading edge and loads the trailing edge relative to the baseline rotor A designs. Rotor C incorporates a more skewed (hub strong) radial distribution of total pressure and smoother distribution of static pressure on the rotor tip than those of rotor B. Candidate stator B embodies twist gradients in the endwall region. Stator C embodies airfoil sections near the endwalls that have reduced trailing edge loading relative to stator A. The baseline and candidate bladings were tested using four identical stages to produce a true multistage environment. Single-stage tests were also conducted. The test data were analyzed and performances were compared. Several of the candidate configurations showed a performance improvement relative to the baseline. A.R.H.

N82-27311*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
QCSEE UNDER-THE-WING ENGINE ACOUSTIC DATA
Harry E. Bloomer and Nick E. Samanich May 1982 28 p refs
(NASA-TM-82691; E-972; NAS 1.15:82691) Avail: NTIS HC A03/MF A01 CSCL 21E

Both an over-the-wing (OTW) and an under-the-wing (UTW) experimental engine are discussed. The UTW engine had a variable-geometry fan exhaust nozzle and a variable-pitch fan that provided quick-response reverse thrust capability. An automatic digital control enabled optimal engine operation under all steady-state conditions as well as during forward and reverse thrust transient operation. The engine was tested at the Engine Noise Test Facility alone and with wind and flap segments to simulate an installation on a short-haul transport aircraft. The engine acoustic configuration was varied to give 14 test configurations. All of the acoustic test results from the UTW program at Lewis are presented as 1/3-octave-band sound pressure level (SPL) tabulations for all of the test points and some narrow-band spectra and 1/3-octave-band data plots for selected conditions. T.M.

N82-27312# Naval Ship Research and Development Center, Bethesda, Md.
PROCEEDINGS OF THE 12TH NAVY SYMPOSIUM ON AEROBALLISTICS, VOLUME 2
14 May 1981 366 p refs Symp. held at Bethesda, Md., 12-14 May 1981 2 Vol.
(AD-A111783) Avail: NTIS HC A16/MF A01 CSCL 20/4

Contents: Current Status of Inlet Flow Prediction Methods; Rotational Flow in a Curved-Wall Diffuser Designed by Using the Inverse Method of Solution of Potential Flow Theory; Aerodynamic Characteristics of a Series of Airbreathing Missile Configurations; Parabolized Navier-Stokes Predictions for Three-Dimensional Viscous Supersonic Flows; Results of a

Government and Industry Survey of the Heating Methods Used to Determine Missile Structural Temperatures; Supersonic Combustor Insulation Ablation Analysis and Tests; Computation of Three-Dimensional Viscous Flow over Blunt Lifting Bodies at High Angle of Attack; Computation of Hypersonic Laminar Viscous Flow over a Body with Mass Transfer and/or Spin at Angle of Attack; Three-Dimensional Viscous Shock-Layer Analysis of Laminar or Turbulent Flows in Chemical Equilibrium; Further Development of the Streamline Method for Determination of Three-Dimensional Flow Separation; Comparison of Numerical Results and Measured Data for Smooth and Indented Nosetips; Structural and Electrical Performance Considerations in the Design of Multiband Radomes; and Structural Considerations for the Recovery of Air-to-Air Missiles. GRA

N82-27313# General Electric Co., Cincinnati, Ohio. Aircraft Engine Business Group.
FOREIGN OBJECT IMPACT DESIGN CRITERIA, VOLUME 2 Interim Technical Report, 31 Dec. 1977 - 31 Dec. 1978
Albert F. Storace Wright-Patterson AFB, Ohio AFAPL Feb. 1982 73 p refs
(Contract F33615-77-C-5221; AF Proj. 3066)
(AD-A112701; R78AEG180-Vol-2; AFAPL-TR-78-81-Vol-2)
Avail: NTIS HC A04/MF A01 CSCL 21/5

The program objective is to establish specific design criteria and provide the analytical design tools to assess and improve the foreign object damage tolerance of turbine engine fan and compressor blading. This program will aid in the design of more efficient damage-tolerant blading through the replacement of trial and error .FOD test and evaluation practices with systematic transient structural analysis methods, test procedures and design criteria. A design system structure was completed and initial versions of the preliminary and final design transient structural response computer programs were developed. In addition, the interface between the bird loading model and the final design response model was completed. Three first stage blades were selected for modeling and testing. Tests and analyses to be used to generate local and gross structural damage design data are in progress and planning was completed for structural element impact tests. Composite and metallic specimens for local and gross damage testing were designed and most of these specimens have been fabricated. A parametric matrix to guide the analyses and validation testing was completed and FOD design criteria goals were formulated for consideration in the program. Author (GRA)

N82-27314# General Electric Co., Cincinnati, Ohio. Aircraft Engine Business Group.
FOREIGN OBJECT IMPACT DESIGN CRITERIA, VOLUME 3 Interim Technical Report, 31 Dec. 1978 - 31 Dec. 1979
Albert F. Storace Wright-Patterson AFB, Ohio AFAPL Feb. 1982 134 p refs
(Contract F33615-77-C-5221; AF Proj. 3066)
(AD-A112447; AFAPL-TR-78-81-Vol-3) Avail: NTIS HC A03/MF A01 CSCL 21/5

Specific design criteria were established and the analytical design tools were provided to assess and improve the foreign object damage (FOD) tolerance of turbine engine fan and compressor blading. Efficient, damage tolerant blading is designed by replacing trial and error FOD test and evaluation practices with systematic transient structural analysis methods, test procedures, and design criteria. A design structure was developed for the purposes of providing a consistent framework in which to constitute the design criteria, guiding the overall technical effort, and formulating a data foundation to define the problem environment. The transient-structural-response and interactive-loading models were developed. Local and structural impact testing, material property determination, error band analysis, and the formulation of design criteria were addressed. The properties for the metallic materials were established, and testing is underway to establish the properties for the composite materials. GRA

N82-27315# Virginia Univ., Charlottesville. Dept. of Mechanical Engineering.
THE SCHLADITZ FUEL INJECTOR: AN INITIAL PERFORMANCE EVALUATION WITHOUT BURNING Final Report, 1 Sep. 1977 - 28 Feb. 1979
G. B. Matthews, J. E. Scott, K. A. Harvey, Jr., and J. Z. Colt, Jr. Mar. 1982 96 p refs
(Contract N00014-77-C-0684)
(AD-A113612; UVA/525335/MAE79/101R) Avail: NTIS HC A05/MF A01 CSCL 21/5

The Schladitz Fuel Injector (SFI) is a network of electrically heated, extremely thin metal whiskers. Tests show that very fine fuel droplet sprays are formed leading to substantial improvements in combustion efficiency. Evaluation of this performance potential, however, requires thorough investigation of the flow rate/pressure drop/heating rate influence on spray quality and droplet distribution. Such tests were performed on two SFI geometries with steady flows of Jet A fuel. When these flows were discharged directly to the atmosphere, pressure drop reached a minimum at heating rates of 280 J/cc. At this point, spray quality improved noticeably, showing substantial fog or mist production, which became complete mist as the heating rate approached three-fourths the Jet A enthalpy of vaporization. Similar tests of SFI flows exhausting through conventional spray nozzles showed appreciable improvement in spray quality, producing 50% or more mist at heating rates about one-third less than those required in the absence of nozzles. GRA

N82-27316*# Naval Air Propulsion Test Center, Trenton, N.J. Propulsion Technology and Project Engineering Dept.
ROTOR FRAGMENT PROTECTION PROGRAM: STATISTICS ON AIRCRAFT GAS TURBINE NGINE ROTOR FAILURES THAT OCCURRED IN U.S. COMMERCIAL AVIATION DURING 1978 Final Report, 1977 - 1978
R. A. DeLucia and J. T. Salvino Sep. 1981 30 p
(NASA Order C-41581-B)
(NASA-CR-165388; NAS 1.26:165388; AD-A113767; NAPC-PE-23) Avail: NTIS HC A03/MF A01 CSCL 21/5

This report presents statistical information relating to the number of gas turbine engine rotor failures which occurred in commercial aviation service use. The predominant failure involved blade fragments, 82.4 percent of which were contained. Although fewer rotor rim, disk, and seal failures occurred, 33.3%, 100% and 50% respectively were uncontained. Sixty-five percent of the 166 rotor failures occurred during the takeoff and climb stages of flight. Author (GRA)

N82-27317# Southwest Research Inst., San Antonio, Tex. Army Fuels and Lubricants Research Lab.
DEVELOPMENT OF ACCELERATED FUEL-ENGINES QUALIFICATION PROCEDURES METHODOLOGY, VOLUME 1 Interim Report, Oct. 1980 - Sep. 1981
J. A. Russell, J. P. Cuellar, Jr., J. C. Tyler, J. Erwin, W. K. Knutson, R. A. Alvarez, R. L. Stanberg (Army Aviation Research and Development Command), F. O. Zimmer (Army Aviation Research and Development Command), R. L. Renta (Mueller Associates, Inc.), and T. J. Timberio (Mueller Associates, Inc.) Dec. 1981 216 p refs 2 Vol.
(Contracts DAAK70-81-C-0209; DAAK70-80-C-0001; DAAK70-82-C-0001; DA Proj. 1L2-63104-D-150)
(AD-A113461; AFLRL-144-Vol-1) Avail: NTIS HC A10/MF A01 CSCL 15/5

Activities and findings are reported for a 12-month program aimed at the development of procedures for accelerating the qualification of new fuels on Army equipment, emphasizing those derived from oil shale and coal. Prinicpal activities were identification of key tactical and combat surface and air vehicles, powerplants, and fuels systems components; identification of critical properties peculiar to new fuels anticipated to have significant impact upon Army materiel; laboratory evaluations of materials compatibility and fuels characteristics (including lubricity, elastomer compatibility, thermal stability, and corrosion); full-scale fuel systems component testing, and an overall review and evaluation of existing engine/fuel system qualification procedures. Conclusions and recommendations are presented in terms of methodology and criteria which will realistically address key peculiarities of alternative fuels and thus serve to accelerate their qualification for field Army use. Author (GRA)

N82-27318# Southwest Research Inst., San Antonio, Tex. Army Fuels and Lubricants Research Lab.
DEVELOPMENT OF ACCELERATED FUEL-ENGINES QUALIFICATION PROCEDURES METHODOLOGY. VOLUME 1: APPENDICES Interim Report, Oct. 1980 - Sep. 1981
J. A. Russell, J. P. Cuellar, Jr., J. C. Tyler, J. Erwin, R. A. Alvarez, W. K. Knutson, R. L. Stanberg (Army Aviation Research and Development Command), F. O. Zimmer (Army Aviation

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[ASME PAPER 82-GT-251]
Joint University Program Air for Transportation
Research, 1981 N82-26190
[NASA-CP-2224]
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Air Force Academy aeronautics digest: Spring/summer 1981
[AD-A112421] N82-27216
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Air Force Academy aeronautics digest: Spring/summer 1981
[AD-A112821] N82-27216
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[AIAA PAPER 82-1045] A82-37677

Research and Development Command), R. L. Rentz (Mueller Associates, Inc.), T. J. Timbario (Mueller Associates, Inc.) et al Dec. 1981 438 p 2 Vol.
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Aircraft engine component listings are included, along with elastomer swell and hardness data and retention properties. Several shale oil fuel test plans are presented. Pre and post test definition data, spot calibration, flow test, fuel characteristics, lubricity and interfacial tension data are also given. Component test results, disassembly and inspection, identification of critical fuel system components, and existing engine qualification procedures are also included. S.L.

N82-27319*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
QUIET SHORT-HAUL RESEARCH AIRPLANE (QSRA) MODEL SELECT PANEL FUNCTIONAL DESCRIPTION
DeLamar M. Watson May 1982 121 p refs
(NASA-TM-84243; A-8915; NAS 1.15:84243) Avail: NTIS HC A06/MF A01 CSCL 01C

The QSRA, when equipped with programmable color cathode ray tube displays, a head up display, a general purpose digital computer and a microwave landing system receiver, will provide a capability to do handling qualities studies and terminal area operating systems experiments as well as to enhance an experimenter's ability to obtain repeatable aircraft performance data. The operating systems experiments include the capability to generate minimum fuel approach and departure paths and to conduct precision approaches to a STOLport runway. The mode select panel is designed to provide both the flexibility needed for a variety of flight test experiments and the minimum workload operation required by pilots flying into congested terminal traffic areas. T.M.

N82-27320# Eagle Technology, Inc., Arlington, Va.
RELIABILITY AND MAINTAINABILITY ANALYSIS OF FLUIDIC BACK-UP FLIGHT CONTROL SYSTEM AND COMPONENTS Final Report
William H. Skewis and David R. Keyser Sep. 1981 61 p refs
(Contract N62269-81-M-3047)
(AD-A110496; NADC-80227-60) Avail: NTIS HC A04/MF A01 CSCL 01/4

Fluidic components being used in various aircraft applications are demonstrating extremely high reliability. However, the unique design of new fluidic components results in a very limited failure rate data base and prevents the determination of numerical values of fluidic system reliability at a sufficient confidence level. This report identifies the potential failure modes of typical components used in a Fluidic Backup Flight Control System and establishes their frequencies of occurrence from published test reports. Author (GRA)

N82-27321# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
DIGITAL COMMAND AUGMENTATION FOR LATERAL DIRECTIONAL AIRCRAFT DYNAMICS M.S. Thesis
David Atzhorn May 1981 203 p refs
(AD-A107264; AFIT-CI-81-55T) Avail: NTIS HC A10/MF A01 CSCL 09/2

Linear-quadratic sampled-data regulator theory is used to design several Type 0 and Type 1 control laws for lateral-directional aircraft dynamics. Control structures are defined for singular command inputs and for control rate outputs; the former allows for precise following of a command whose integral appears in the state vector, while the latter uses both a difference approximation and the Tustin transform to characterize control rate in the discrete-time domain. Type 0 controllers with control rate restraint and 'equivalent' Type 1 controllers are implemented in a microprocessor-based digital flight control system, and flight tests are conducted using Princeton University's Variable-Response Research Aircraft. The control system, entitled CAS-4, offers four combinations of control: direct (unaugmented) control, Type 0 control with both roll rate/sideslip angle and roll rate/lateral acceleration command combinations, and Type 1 control with roll rate/sideslip angle command. Ground-based hybrid simulation and flight tests results show that major closed-loop response features are unaffected by the choice of sampling rate when sampled-data regulator is used. Consequently, much lower sampling rates than would normally be expected can be used when control laws are derived in this manner (a sampling rate of 10 sps is primarily used in this investigation, though lower sampling rates are investigated as well). The results derived through this investigation and presented herein provide additional evidence that digital flight control through modern control theory will be a practical way of implementing flight control systems in future high performance aircraft. GRA

N82-27322# Systems Research Labs., Inc., Dayton, Ohio.
NOTES ON LATERAL-DIRECTIONAL PILOT INDUCED OSCILLATIONS Final Report, May 1979 - May 1981
Ralph H. Smith Wright-Patterson AFB, Ohio AFWAL Mar. 1982 84 p refs
(Contract F33615-79-C-3620; AF Proj. 2403)
(AD-A113996; AFWAL-TR-81-3090) Avail: NTIS HC A05/MF A01 CSCL 05/8

A method is developed for the assessment of lateral-directional pilot induced oscillation (PIO) tendencies. The method is applicable regardless of the flight control system mechanization. The relations between linear and non-linear system effects on the probability or nature of PIO are discussed. In its simplest form, the method proposed for PIO assessment is very similar to methods currently in use. The principal difference is that quantitative methods are provided for the identification of specific frequencies at which appropriate stability criteria must be satisfied if PIO is not to be a possibility. Based upon analyses in this report, the single axis, bank angle PIO is believed to be the most commonly encountered lateral-directional PIO. The possibility for pitch only PIO in the longitudinal mode is discussed. The methods of this report are believed to apply to the study of longitudinal PIO. Author (GRA)

N82-27323# General Electric Co., Daytona Beach, Fla. Space Div.
SYSTEM DESCRIPTION-AVIATION WIDE-ANGLE VISUAL SYSTEM (AWAVS) COMPUTER IMAGE Final Report
D. V. Morland and F. A. Michler Orlando, Fla. Naval Training Equipment Center May 1981 93 p refs
(Contracts N61339-76-C-0048; N61339-79-C-0143)
(AD-A111800; NAVTRAEQUIPC-76-C-0048-1) Avail: NTIS HC A05/MF A01 CSCL 05/9

This report provides an overall description of the Aviation Wide Angle Visual System (AWAVS) Computer Image Generator (CIG) System installed at the Naval Training Equipment Center in Orlando, Florida. The report includes descriptions of system functions and capabilities, system hardware and new technology features incorporated in the CIG System design. This revised report includes descriptions of additions to original CIG which are identified by margin bars. Also, the AWAVS name has been changed to Visual Technology Research Simulator, VTRS. Author (GRA)

N82-27324# Canyon Research Group, Inc., Westlake Village, Calif.
REPORTS BY SYSTEMS TECHNOLOGY, INC., IN SUPPORT OF CARRIER-LANDING RESEARCH IN THE VISUAL TECHNOLOGY RESEARCH SIMULATOR Interim Report, 1 May 1980 - 30 Nov. 1981
W. F. Jewell, H. R. Jex, R. E. Magdaleno, and R. F. Ringland Dec. 1981 65 p refs
(Contract N61339-78-C-0060)
(AD-A112466; TR-81-025; NAVTRAEQUIPC-78-C-0060-10) Avail: NTIS HC A04/MF A01 CSCL 01/2

The following work was undertaken: (1) Development of a quasi-random turbulence model. This model was preferred to the one provided initially with the VTRS system because it enabled better analysis of pilot responses to turbulence inputs. The STI model is expected to be appropriate for tasks other than carrier landings and for simulations of other aircraft types. (2) Modification of the T-2C simulation to more closely represent the A-7 and F-18 aircraft. (3) Application and evaluation of STI's Non-Intrusive Pilot Identification Program (NIPIP), which was developed to estimate the pilot's input-output describing function and combined pilot-vehicle performance parameters such as crossover frequency and phase margin by using a time domain model of the pilot and a least-squares identification algorithm. NIPIP functions in real-time and uses a sliding time window to maintain freshness in the data; thus time-varying characteristics in the pilot's control strategy can be measured. GRA

N82-27325# Army Cold Regions Research and Engineering Lab., Hanover, N. H.
COLD REGIONS TESTING OF AN AIR TRANSPORTABLE SHELTER
Stephen N. Flanders Aug. 1981 28 p refs
(DA Proj. 4A7-82730-AT-42)
(AD-A107131; CRREL-81-16) Avail: NTIS HC A03/MF A01 CSCL 13/13

An air-transportable shelter designed and built at CRREL for use in cold regions underwent testing in Hanover, New Hampshire, and Ft. Greely, Alaska. The shelter demonstrated some of its capabilities for mobility by being towed for more than 60 miles behind various vehicles and by being transported on a C-130 cargo airplane, a CH-47 helicopter, and a trailer truck. The shelter proved to be very easy for a crew of two to four to set up in all weather conditions including -40 F cold. However, the gasoline-powered generator, which was a source for space heat as well as electricity, functioned very poorly. Overall, the prototype successfully demonstrated qualities of self-reliance, ease of operation and thermal efficiency.
Author (GRA)

N82-27326# Florida Univ., Gainesville. Dept. of Environmental Engineering Sciences.
FIELD TEST OF AN IN STACK DIFFUSION CLASSIFIER ON AN AIRCRAFT ENGINE TEST CELL Final Report, Jun. - Dec. 1980
Dale A. Lundgren and Brian J. Hausknecht Tyndall AFB, Fla. Air Force Engineering and Services Center Apr. 1981 40 p
(Grant EPA-R-805762-02-2; AF Proj. 1900)
(AD-A113811; AFESC/ESL-TR-81-21) Avail: NTIS HC A03/MF A01 CSCL 14/2

An in-stack diffusion classifier was field tested at Tyndall Air Force Base, Florida. Particle size distribution measurements were made on the exhaust stream from the engine test cell while running a J75-P17 jet engine. Samples were collected at the test cell exhaust plane using a University of Washington in stack cascade impactor followed, in series, by an in stack diffusion classifier being developed at University of Florida. In addition, total particulate samples were obtained using absolute filters to determine particulate mass concentration in the exhaust gases. Opacity readings of the plume were also taken during sampling. The procedures to collect significant data and the general problems encountered to generate a reasonable estimate of jet exhaust aerosol size distribution using a diffusion classifier are described in this report.
Author (GRA)

N82-27411# Lockheed Missiles and Space Co., Palo Alto, Calif.
PANEL OPTIMIZATION WITH INTEGRATED SOFTWARE (POIS), VOLUME 2. USER INSTRUCTIONS: ECHO AND RRSYS Final Report, Jun. 1976 - Oct. 1980
P. Stern, B. O. Almroth, and P. Stehlin Wright-Patterson AFB, Ohio AFWAL Mar. 1981 135 p refs
(Contract F33615-76-C-3105; AF Proj. 2307)
(AD-A112224; AFWAL-TR-81-3073-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 01/3

Optimization of structural panels with respect to bifurcation buckling constraints tends to lead to imperfection sensitive panels. The panels may not represent least weight configurations if the influence of always present geometrical imperfections are taken into account. A software package, POIS (Panel Optimization with Integrated Software) was developed in response to this problem. Here user instructions are presented for Computer Program ECHO and RRSYS which are part of the POIS system. ECHO is a collection of computer programs for least weight design of stiffened structural panels subjected to multiple combinations of inplane loads. ECHO includes program modules for optimization of perfect panels and nonlinear static stress analysis of panels with random imperfections. The optimization problem is carried out as a constrained function minimization problem in which buckling loads, stress, and strain may be constraints. RRSYS is a program system for the nonlinear analysis of elastic structures by means of the Rayleigh-Ritz method. RRSYS is designed to analyze such diverse structural phenomena as collapse, linear and nonlinear bifurcation, vibrations and transient dynamic response.
Author (GRA)

N82-27434# Exxon Research and Engineering Co., Linden, N.J. Corporate Research-Technology Feasibility Center.
RADIATION/CATALYTIC AUGMENTED COMBUSTION Final Report, 1 Jun. 1977 - 28 Feb. 1981
Moshe Lavid Jul. 1981 40 p refs
(Contract F49620-77-C-0085; AF Proj. 2308)
(AD-A112376; AFOSR-82-0132TR) Avail: NTIS HC A03/MF A01 CSCL 21/2

Two techniques for extending aircraft operational range are reported. They are radiative and catalytic augmentation techniques to enhance combustion initiation and reaction kinetics which restrict combustor operation via limits on flammability, flame propagation, ignition and stability. Both techniques demonstrated the capability to enhance combustion processes and to broaden normally encountered stability limits. The radiative technique under laboratory static conditions successfully ignited fuel air mixtures, and enhanced combustion processes, utilizing pulsed and continuous VUV light souces. Similarly, the catalytic technique provided efficient combustion under normally difficult fuel lean, low temperature, conditions. A complementary effort involves the development of analytical capability required for modeling the radiative and catalytic techniques. Radiative ignition and combustion enhancement tests were performed on gaseous mixtures under various static conditions. Successful radiative ignitions were obtained with pulsed and continuous VUV/UV light sources.
GRA

N82-27438# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.
MODELING SOLID-FUEL RAMJET COMBUSTION INCLUDING RADIATION HEAT TRANSFER TO THE FUEL SURFACE Interim Report
Michael E. Metochianakis (Greek Air Force), William V. Goodwin, Uri Katz, and David W. Netzer Aug. 1981 50 p refs
(AD-A107441; NPS67-81-012) Avail: NTIS HC A03/MF A01 CSCL 21/5

Radiation heat transfer from soot in the flame zone to the fuel surface of a solid fuel ramjet was incorporated into an existing two-dimensional computer code. Improved prediction of the fuel regression pattern was obtained. Near-wall temperature measurements indicated that the model predicts too much turbulent mixing near the fuel surface.
Author (GRA)

N82-27506# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
CORROSION TESTS WITH MIL-H-83282 AND MIL-H-6083 AIRCRAFT HYDRAULIC FLUIDS Final Report
Alfeo A. Conte, Jr. 25 Jan. 1982 12 p
(WF6154200)
(AD-A112437; NADC-81301-60) Avail: NTIS HC A02/MF A01 CSCL 11/8

Corrosion tests were performed to determine whether MIL-H-83282 hydraulic fluid could be used in place of MIL-H-6083 preservative fluid in Intermediate Maintenance Activity (IMA) and NAVAIREWORKFAC hydraulic test stands. The results presented in this report show that MIL-H-83282 can not be considered as a suitable alternative fluid.
Author (GRA)

N82-27512# Dayton Univ., Ohio. Research Inst.
EVALUATION OF PLASMA SOURCE SPECTROMETERS FOR THE AIR FORCE OIL ANALYSIS PROGRAM Interim Report, 30 Aug. 1977 - 30 Sep. 1980
Wendell E. Rhine, Costandy S. Saba, Robert E. Kauffman, John R. Brown, and Patricia S. Fair Wright-Patterson AFB, Ohio AFWAL Feb. 1982 354 p refs
(Contract F33615-76-C-5312; AF Proj. 2303)
(AD-A113809; AFWAL-TR-82-4017) Avail: NTIS HC A16/MF A01 CSCL 14/2

An investigation was conducted in order to evaluate two plasma source emission spectrometers for use in the Air Force Oil Analysis Program (OAP). The high temperatures of the plasma sources were expected to improve the Oil Analysis Program's capability to analyze wear metal particulates. The work is presented in two phases. Phase I of the work dealt with determining the capabilities of the two plasma instruments as well as the currently used OAP spectrometers. During this phase of the work the sample introduction systems were identified as the reason each instrument could not detect particles larger than 3-10 Microns. Phase 2 of the work dealt with optimizing the sample introduction systems so that particles could be more efficiently transported where they could be analyzed. The improved systems were capable of analyzing particles as large as 14-20 Microns.
GRA

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Panel Optimization with Integrated Software (POIS), Volume 2. User instructions: ECHO and RRSYS
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N82-27519*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF SOME NITROGEN COMPOUNDS THERMAL STABILITY OF JET A

Albert C. Antoine Jun. 1982 20 p refs
(NASA-TM-82908; NAS 1.15:82908) Avail: NTIS HC A02/MF A01 CSCL 21D

The effect of known concentrations of some nitrogen containing compounds on the thermal stability of a conventional fuel, namely, Jet A was investigated. The concentration range from 0.01 to 0.1 wt% nitrogen was examined. Solutions were made containing, individually, pyrrole, indole, quinoline, pyridine, and 4 ethylpyridine at 0.01, 0.03, 0.06, and 0.1 wt% nitrogen concentrations in Jet A. The measurements were all made by using a standard ASTM test for evaluating fuel thermal oxidation behavior, namely, ASTM D3241, 'thermal oxidation stability of turbine fuels (JFTOT procedure).' Measurements were made at two temperature settings, and 'breakpoint temperatures' were determined. The results show that the pyrrole and indole solutions have breakpoint temperatures substantially lower than those of the Jet A used. S.L.

N82-27523# Amoco Oil Co., Naperville, Ill. Research and Development Dept.

EVALUATION OF HYDROCRACKING CATALYSTS FOR CONVERSION OF WHOLE SHALE OIL INTO HIGH YIELDS OF JET FUELS Final Report, Dec. 1979 - Oct. 1981

A. M. Tait and A. L. Hensley Wright-Patterson AFB, Ohio AFWAL Oct. 1981 196 p refs
(Contract F33615-79-C-2095; AF Proj. 3048)
(AD-A112820; M81-65; AFWAL-TR-81-2098) Avail: NTIS HC A09/MF A01 CSCL 21/4

A catalyst development and screening program has led to a formulation capable of upgrading whole shale oil into high yields of military jet fuel in a single operation. The catalyst is multifaceted in its functionality in that it sequentially saturates, denitrogenates, and hydrocracks the feedstock in the presence of high levels of contaminants, such as organic nitrogen compounds and ammonia, while maintaining a high selectivity towards jet-fuel, boiling range material. The catalyst, developed by optimization of both chemical and physical properties, consists of 1.5% cobalt oxide, 10% chromium oxide, and 15% molybdenum oxide on a support of 50% ultrastable molecular sieve in alumina. The effectiveness of the catalyst for the direct upgrading of an Occidental whole shale oil was demonstrated in a 100-day test. The feed, containing approximately 15 weight percent material boiling within the range for JP-4 and containing 13,000 ppm nitrogen, was upgraded to a water-white product containing 1 to 3 ppm nitrogen and approximately 75% JP-4 material. The hydrogen consumption required for this level of upgrading and conversion was approximately 1800 SCFB. The catalyst developed represents an advance in shale oil upgrading technology over more conventional petroleum-based technology. Author (GRA)

N82-27524# Simmonds Precision Products, Inc., Vergennes, Vermont.

COMMERCIAL AIRCRAFT AIRFRAME FUEL SYSTEMS SURVEYS Interim Report, Oct. 1980 - Oct. 1981

P. G. Weitz Atlantic City FAA Feb. 1982 55 p refs
(Contract DTFA03-80-C-0080)
(AD-A112241; E-2304; FAA-CT-82/12) Avail: NTIS HC A04/MF A01 CSCL 20/4

A selection of commercial aircraft airframe fuel systems has been studied to determine areas where incompatibility with antimisting kerosene fuel (AMK) may exist. Incompatibility can be due to reduced fuel system component performance with AMK or shear degradation of the AMK by the fuel system components. Survey results, to date, indicate that potential component performance problems with AMK are more significant than loss of AMK flammability protection due to shear degradation. Components of interest include ejector pumps, fuel filters, and auxiliary power units. The solubility of water in AMK and its effect on fuel system performance under actual operating conditions is also of major importance. Author (GRA)

N82-27527# Naval Postgraduate School, Monterey, Calif.

AN INVESTIGATION OF ENGINE AND TEST CELL OPERATING CONDITIONS ON THE EFFECTIVENESS OF SMOKE SUPPRESSANT FUEL ADDITIVES M.S. Thesis

Donald Wendell Thornburg Dec. 1981 103 p refs
(Contract N6237681-WR-00014)
(AD-A112800) Avail: NTIS HC A06/MF A01 CSCL 13/2

Tests were conducted in a one-eighth scale turbojet test cell with a ramjet type combustor to investigate the effects of fuel additives on smoke reduction. Particle size and mass concentrations were determined at the engine and stack exhaust using three wavelength optical detector systems. Particulate samples were also collected at the engine exhaust and analyzed with a scanning electron microscope. Combustor temperature and fuel additives were found to significantly affect particulate mass concentrations emitted from the engine while particle size appeared to be unaffected. No significant changes in the particulate size or mass occurred from the engine exhaust to the stack exhaust. The optical determination of exhaust mean particulate size/mass concentration with three wavelength optical detector systems appears to be a good and reasonably accurate technique for evaluating the effects of engine and test cell operating conditions and fuel composition changes on the emitted particulates. Author (GRA)

N82-27548# National Bureau of Standards, Washington, D.C.

HURRICANE-INDUCED WIND LOADS

Martin E. Batts and Emil Simiu Aug. 1981 23 p refs
(Grant NSF CEE-80-25718)
(PB82-132267; NBS-DF-81/005A) Avail: NTIS HC A02/MF A01 CSCL 13M

A computer program was developed that uses as input the aerodynamic coefficients corresponding to eight or sixteen compass directions and produces as output wind loads on cladding or structural members corresponding to various mean recurrence intervals. GRA

N82-27558* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SPIRAL SLOTTED PHASED ANTENNA ARRAY Patent

Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 9 Feb. 1982 7 p Filed 25 Jul. 1980 Supersedes N80-29543 (18 - 20, p 2685) Sponsored by NASA
(NASA-Case-MSC-18532-1; US-Patent-4,315,266;
US-Patent-Appl-SN-172099; US-Patent-Class-343-895;
US-Patent-Class-343-789) Avail: US Patent and Trademark Office CSCL 20N

A flush mounting, cavity-backed, dual orthogonal slot antenna for aircraft and space vehicles is described. Improved radiation pattern characteristics are obtained by making the spiral slot pattern elliptical in the aperture plane. A cavity and a flanged aperture plate are configured such that one slot pair is orthogonal with respect to another slot pair within the aperture plate. Coaxial split-tube baluns are used to drive the junctions between corresponding slot pairs. An optional cavity dielectric is provided and a drive coupling arrangement includes a four port comparator hybrid having sum and difference ports respectively, for alternate excitation to produce a single lobe or a double lobe pattern with null. Switching apparatus is provided to connect a common terminal to either of the ports.
Official Gazette of the U.S. Patent and Trademark Office

N82-27561# Auburn Univ., Ala. Engineering Experiment Station.

AUTOMATIC HANDOFF OF MULTIPLE TARGETS Final Technial Report, 10 Oct. 1980 - 14 Sep. 1981

J. S. Boland, III, H. S. Ranganath, and D. V. Satish Chandra Redstone Arsenal, Ala. Army Missile Command 14 Sep. 1981 166 p refs
(Contract DAAH01-80-C-0258)
(AD-A107490; AD-E950176; DRSMI/RG-CR-81-4) Avail: NTIS HC A08/MF A01 CSCL 17/5

In order to fully utilize the potential of the 'fire and forget' class of helicopter-borne missiles, it is necessary to solve the technical problems associated with acquiring and handing off multiple targets from a precision pointing and tracking system (PTS) to several missile seekers simultaneously or almost so in a short period of time. The multiple target problem is that of locating targets and missile seeker aim points within the PTS field of view, deciding which target is to be assigned to each missile, generating error signals to the torquers in order to slew the missile LOS such that its assigned target is in the center of its FOV, and initiating automatic seeker tracking. The task of locating a given smaller image within a larger image is known as 'image registration'. A detailed comparison of the important multiple image registration methods based on the number of arithmetic operations for software implementation and the complexity of hardware for real time implementation is presented.

New methods of accomplishing multiple image registration which are computationally more efficient than the most commonly used template matching techniques (correlation and sequential similarity detection algorithm) are described. Several methods are compared with respect to hardware requirements and speed of computation. Author (GRA)

N82-27573# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
SOFTWARE FUNCTIONAL DESCRIPTION OF MASS WEATHER DISSEMINATION SYSTEM EXPLORATORY ENGINEERING MODEL Final Report
Louis Delemarre Feb. 1982 52 p
(FAA Proj. 131-401-835)
(AD-A112706; DOT/FAA/CT-81/33; FAA-RD-82-1) Avail: NTIS HC A04/MF A01 CSCL 17/2

This report describes the Mass Weather Dissemination System Exploratory Engineering Model software currently being evaluated in the Flight Service Station Engineering Laboratory. The object of this effort is to investigate, through development, test and evaluation, the application of digital technology to the dissemination of meteorological and aeronautical information. The prototype model is a fully-automated system designed to transfer a significant amount of workload from the flight service station specialist to system hardware/software in order to provide better service to the flying public. Author (GRA)

N82-27588# Ball Aerospace Systems Div., Boulder, Colo.
ADVANCED MICROSTRIP ANTENNA DEVELOPMENTS. VOLUME 2: MICROSTRIP GPS ANTENNAS FOR GENERAL AVIATION AIRCRAFT Final Report, Apr. 1979 - Jun. 1980
Gary G. Sanford and Brian D. Gross Mar. 1982 48 p
(Grant DOT-TSC-1397-1)
(AD-A113620; FAA-EM-80-12-2; TSC-FAA-80-15-Vol-2) Avail: NTIS HC A03/MF A01 CSCL 09/5

This report describes the application of microstrip antenna technology to the design of general aviation (G/A) aircraft antennas for use with the Global Positioning System (GPS). For most G/A aircraft, only single frequency operation will be required. However, air-carrier and some large corporate aircraft may make use of dual-frequency operation. For this reason, some dual-frequency designs have been investigated. The main effort was given to the design of antennas with broad beamwidths which could be switched or steered to compensate for aircraft maneuvers, with the goal of maintaining near-hemispherical carriage in flight. A hybrid microstrip crossed-slot and sleeve-dipole element used with a suitable combining network gives a suitable, controllable broad-beam pattern. This element and its performance are described. In addition, radiation patterns are presented using scale-model aircraft and simple crossed-slot antennas. Author (GRA)

N82-27609# Forschungsinstitut fuer Anthropotechnik, Bonn (West Germany).
INFLUENCE OF CONTRAST ON SPATIAL PERCEPTION IN TV DISPLAY OF MOVING IMAGES [EINFLUSS DES KONTRASTES AUF DIE RAUMWAHRNEHMUNG BEI TV -FLUGAUSSENSICHT- DARSTELLUNGEN]
H. Heising Sep. 1981 80 p refs In GERMAN; ENGLISH summary
(FB-50) Avail: NTIS HC A05/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 10

A low cost visual simulation system was developed which involves a hybrid computer controlled transformation of perspective on a raster scan TV display. It is applicable to a wide range of simulation tasks, including training and research, but is especially useful in facilitating detection of moving objects and reducing frame rate in RPV applications with a number of advantages, e.g., reduction of bandwidth and improved protection against jamming. Because of the perspective transformation in TV raster scan, a change of contrast can occur during the display of moving images. Therefore, it is of interest to know the effect of this contrast change on human spatial perception. The investigations undertaken led to the conclusion that the physical contrast in the ratio range of l:ll to 1:25 (by a medium illuminance of 7 cd/sqm at the white parts of the picture) does not influence human distance and height judgments. Author (ESA)

N82-27658# Boeing Military Airplane Development, Seattle, Wash. Mechanical/Electrical Systems Technology.
PROTECTION OF ADVANCED ELECTRICAL POWER SYSTEMS FROM ATMOSPHERIC ELECTROMAGNETIC HAZARDS Final Report, 15 Jun. 1979 - 15 Oct. 1981
David L. Sommer Wright-Patterson AFB, Ohio AFWAL Dec. 1981 233 p refs
(Contract F33615-79-C-2006; AF Proj. 3145)
(AD-A112612; D180-26154-2; AFWAL-TR-81-2117) Avail: NTIS HC A11/MF A01 CSCL 01/3

The effects of lightning strikes on aircraft and the resulting transients coupled onto the electrical systems were investigated. The historical background and overall scope of the study are presented. The lightning threat is defined and electrical system math models are developed. The normal design of aircraft for inherent hardness is evaluated. Wire routing, equipment location, fiber optics, threat level comparisons and the evaluation of specific electrical circuits are assessed. The effects of using add on protection to suppress induced transients on the electrical system are analyzed. Protection schemes include cable shielding, linear protection devices, nonlinear protection devices and conductive coatings applied to the aircraft skin. The design guide provides the most appropriate lightning hardening techniques is summarized. Reliability/maintainability, system safety and design to cost considerations are discussed. Protection criteria to develop a lightning tolerant electrical system are included. E.A.K.

N82-27659# Boeing Military Airplane Development, Seattle, Wash. Mechanical/Electrical Systems Technology.
PROTECTION OF ELECTRICAL SYSTEMS FROM EM HAZARDS: DESIGN GUIDE Interim Report, Jun. 1979 - Oct. 1981
David L. Sommer Wright-Patterson AFB, Ohio AFWAL Sep. 1981 211 p refs
(Contract F33615-79-C-2006)
(AD-A112707; D180-26154-3; AFWAL-TR-81-2118) Avail: NTIS HC A10/MF A01 CSCL 01/3

This report contains results of a two-phase study program investigating the effects of lightning strikes on aircraft and the resulting transients coupled on to the electrical systems. The design guide contains the historical background and the lighting threat assessment in the sections 1 and 2. Section 3 of the design guide contains the techniques for inherent hardening against the lightning strike electromagnetic energy. Section of 4 of the design guide provides two methods for evaluating electrical systems to determine the levels of transients that can be induced. The first method allows an electrical systems designer to make a preliminary assessment of the lightning strike threats. The second method allows a more detailed evaluation using a computer program called PRESTO. Section 5 identifies and examines the various military specifications covering the transients that existing electrical equipment has to withstand. Using this information, add-on protection hardware and hardening techniques were evaluated in Sections 6 and 7. Section 8 provides examples for selecting hardening techniques for advanced electrical systems. Sections 9, 10, and 11 discuss the reliability/maintainability, system safety and Design to Cost considerations in selection of the appropriate hardening techniques. Author (GRA)

N82-27663# McDonnell Aircraft Co., St. Louis, Mo. Lightning-Lab.
ASSESSMENT OF LIGHTNING SIMULATION TEST TECHNIQUES, PART 1 Final Report, Jul. 1980 - Oct. 1981
W. G. Butters, D. W. Clifford, K. P. Murphy, and K. S. Zeisel Oct. 1981 128 p refs Sponsored in part by Navy
(Contract F33615-80-C-3406; AF Proj. 2402)
(AD-A112626; AFWAL-TR-81-3075-Pt-1) Avail: NTIS HC A07/MF A01 CSCL 14/2

The program objective was to assess the current pulse and shock-excitation lightning simulation test techniques. The current pulse test technique applies a pulsed current stimulus to the test article, while the shock-excitation technique first charges the test article to a high voltage which then produces a rapid voltage/current pulse on the test article as the spark gap (between the test article and the return conductors) breaks down. Direct comparisons of the induced voltage response on interior circuits were made for the two test techniques. The interior circuits were high-impedance differential wire pairs typical of many flight-critical in advanced aircraft. The program was divided into three tasks: (1) an analytical task to model both test techniques to provide a theoretical base, (2) comparative tests using an aluminum cylinder and simple interior circuits that were readily modeled, and (3) comparative tests on the flight control circuits of a full-scale YF-16 fighter aircraft. The cylinder test configuration was modeled as two coupled transmission line circuits. The generator, cylinder, return lines, and the output configuration

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BIBLIOGRAPHIES
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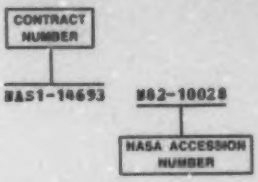

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between the cylinder and the return line comprise the primary tranmission line that interacts with an interior circuit transmission line via aperture coupling. GRA

N82-27743*# Curtiss-Wright Corp., Wood-Ridge, N.J. Rotary Engine Facility.

ADVANCED STRATIFIED CHARGE ROTARY AIRCRAFT ENGINE DESIGN STUDY

P. Badgley, M. Berkowitz, C. Jones, D. Myers, E. Norwood, W. B. Pratt, D. R. Ellis (Cessna Aircraft Corp.), G. Huggins (Cessna Aircraft Corp.), A. Mueller (Cessna Aircraft Corp.), and J. H. Hembrey (Cessna Aircraft Corp.) 29 Jan. 1982 149 p refs
(Contract NAS3-21285)
(NASA-CR-165398; NAS 1.26:165398; CW-WR-81.021) Avail: NTIS HC A07/MF A01 CSCL 21A

A technology base of new developments which offered potential benefits to a general aviation engine was compiled and ranked. Using design approaches selected from the ranked list, conceptual design studies were performed of an advanced and a highly advanced engine sized to provide 186/250 shaft Kw/HP under cruise conditions at 7620/25,000 m/ft altitude. These are turbocharged, direct-injected stratified charge engines intended for commercial introduction in the early 1990's. The engine descriptive data includes tables, curves, and drawings depicting configuration, performance, weights and sizes, heat rejection, ignition and fuel injection system descriptions, maintenance requirements, and scaling data for varying power. An engine-airframe integration study of the resulting engines in advanced airframes was performed on a comparative basis with current production type engines. The results show airplane performance, costs, noise & installation factors. The rotary-engined airplanes display substantial improvements over the baseline, including 30 to 35% lower fuel usage. A.R.H.

N82-27784# Systems Research Labs., Inc., Dayton, Ohio. Research Applications Div.

MECHANICAL PROPERTY CHARACTERIZATION AND MODELING OF STRUCTURAL MATERIALS Final Report, Jun. 1979 - May 1981

Noel E. Ashbaugh, Henry L. Bernstein, Bhaskar Majumdar, and Jalees Ahmad Wright-Patterson AFB, Ohio AFWAL Feb. 1982 132 p refs
(Contract F33615-79-C-5025; AF Proj. 2307)
(AD-A113841; SRL-9799; AFWAL-TR-81-4187) Avail: NTIS HC A07/MF A01 CSCL 11/4

The crack growth behavior of engine disk nickel base superalloys operating in the temperature range 538-760 C was investigated. The effects of sustained load upon crack growth, crack growth in deleterious environments, and crack initiation and growth of short cracks were emphasized. Crack growth rate models were developed based upon experimental results and upon analytical characterization of fundamental processes which occur during crack growth. Mechanical property data were generated from tests including uniaxial tension, compression, bend, creep fatigue, low cycle fatigue, crack initiation, sustained load crack growth, and fatigue crack growth. The materials tested included nickel base superalloys, titanium, aluminum, and other structural materials. GRA

N82-27864# Ministry of the Environment, Ottawa (Ontario). Pollution Control Branch.

TRANSPORTATION NOISE, ITS IMPACT, PLANNING AND REGULATION

J. Manuel 1981 19 p refs Presented at the Intern. Symp. on Transportation Noise, Pretoria, 21-23 Oct. 1981
(S-258) Avail: NTIS HC A02/MF A01

Examples of the effects transportation noise has on communities are provided. Recent work in noise pollution in Canada is highlighted. National policies were examined and regulations were reviewed. T.M.

N82-27865# Airbus Industrie, Blagnac (France). Acoustics Dept. of Aerospatiale.

AIRBUS INDUSTRIE AND COMMUNITY NOISE

J. Chausonnet 1981 35 p Presented at the Intern. Symp. on Transportation Noise, Pretoria, 21-23 Oct. 1981
Avail: NTIS HC A03/MF A01

The contributions of the total noise perceived outside an aircraft during takeoff and landing by the engine and the aerodynamics of the aircraft are considered. The reduction of engine noise by design, the location of the engine and acoustic treatment of the nacelles is discussed. Aerodynamic noise reduction is considered in terms of aircraft design, operational procedures, and aircraft weight. A noise measuring facility used for checking operational procedures and measuring noise levels is described. Author

N82-27869# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

CONTROL OF AIR POLLUTION FROM AVIATION: THE EMISSION STANDARD SETTING PROCESS Ph.D. Thesis

Dennis Freeman Naugle 1981 260 p refs
(AD-A107435; AFIT-CI-81-26D) Avail: NTIS HC A12/MF A01 CSCL 01/2

The potential effects of aviation on ambient air quality with special emphasis on the requirement and techniques for setting aviation control standards are discussed. A logical framework called the 'hypothesis decision model' was developed. It offers a structured way of dealing with complex issues. Application of the model focuses on aircraft sources but a generic version is also proposed. Adoption would explicitly document the manner that technical evidence is considered in a variety of decisions concerning the establishment of emission standards. Author

N82-27900# Ohio State Univ., Columbus. Dept. of Geodetic Science and Surveying.

THE EARTH'S GRAVITY FIELD TO DEGREE AND ORDER 180 USING SEASAT ALTIMETER DATA, TERRESTRIAL GRAVITY DATA AND OTHER DATA

Richard H. Rapp Hanscom AFB, Mass. AFGL Dec. 1981 58 p refs
(Contract F19628-79-C-0027; AF Proj. 2309)
(AD-A113098; DGS-322; SCIENTIFIC-12; AFGL-TR-82-0019) Avail: NTIS HC A04/MF A01 CSCL 08/14

The spherical harmonic expansion of the Earth's gravitational field has been obtained to degree 180 by combining several sources of data. The first data set was an a priori set of potential coefficients to degree 36 based on number of recent solutions including a substantial of resonance terms. A second data set was a 1 x 1 deg anomaly field derived from the SEASAT data set, while the third data set was an updated 1 x 1 deg terrestrial field. The last two fields were combined into one set containing 56761 1 x 1 deg values. The remaining values were computed from the a priori potential coefficients. A rigorous combination solution was not carried out. Instead all anomalies were weighted in such a way that the normal equations were diagonal. The results of the adjustment were 64800 1 x 1 deg anomalies that were expanded into spherical harmonics using the optimum quadrature procedure developed by Colombo. Accuracy estimates for each coefficient were obtained considering noise propagation and sampling error caused by the finite block size in which the anomalies are given. The percentage error of the solution reaches 100% near degree 120. The coefficients and their accuracy to degree 50 are listed in an appendix. GRA

N82-27924# Federal Aviation Administration, Atlantic City, N.J.

TEST AND EVALUATION OF THE AIRPORT RADAR WIND SHEAR DETECTION SYSTEM Final Report, Mar. 1978 - May 1981

Dominick L. Offi, William Lewis, Tai Lee, and Alfred DeLaMarche Feb. 1982 39 p refs
(FAA Proj. 022-242-830)
(AD-A112663; DOT/FAA/CT-81/63; FAA-RD-81-85) Avail: NTIS HC A03/MF A01 CSCL 17/9

A wind shear detection system, developed to operate with airport surveillance radar ASH-(8), was installed and tested. Initial tests consisted of hardware and software shakedown and feasibility determinations. Second phase tests compared radar with aircraft and tower winds, evaluated the wind shear measurement capability under various weather conditions, and investigated the effectiveness of a simple two azimuth pointing strategy. Final efforts consisted of observations in all weather regimes and tests of a modified velocity azimuth display (VAD) and a glide slope scan. Results showed the system was compatible with and operate satisfactorily with the ASR-8. The processing and spectral display of clear air and precipitation returns is feasible. The accuracy of agreement, between radar measured winds and components of the aircraft measured winds in both radially oriented flights and runway offset flights using a two azimuth pointing technique, a glide slope scan, and a modified VAD was examined. GRA

N82-28007# McDonnell-Douglas Electronics Co., St. Charles, Mo.
ADVANCED TRAINING TECHNIQUES USING COMPUTER GENERATED IMAGERY Annual Technique Report, 16 May 1980 - 15 Jul. 1981
D. Hauck and D. Soblitz 15 Sep. 1981 74 p refs
(Contract F49620-79-C-0067; AF Proj. 2313)
(AD-A111979; MDC-M3026; AFOSR-82-0180TR) Avail: NTIS HC A04/MF A01 CSCL 05/9

Aircraft simulator systems have been primarily designed as substitutes for actual aircraft. The computer generated imagery of these systems provides the flexibility to enhance training in ways that cannot be done in the real world. The thrust of this research is to conceive and demonstrate training approaches to take advantage of this flexibility as a step towards reducing pilot combat attrition and increasing readiness. Two broad categories of techniques are available to us: (1) synthesizing tasks that are untrainable in aircraft during peacetime but are required during combat; and (2) application of teaching/learning methods unavailable in aircraft. Exploratory testing has begun on numerous techniques. A VITAL IV computer generated image (CGI) system has been used for testing and demonstration. Author (GRA)

N82-28016# Honeywell Systems and Research Center, Minneapolis, Minn. Operations Training Div.
COMPUTER IMAGE GENERATION: ADVANCED VISUAL/SENSOR SIMULATION Final Report
David Serreyn and David Duncan Brooks AFB, Texas AFHRL Oct. 1981 51 p refs
(Contract F33615-80-C-0006; AF Proj. 6114)
(AD-A107098; AFHRL-TP-81-23) Avail: NTIS HC A04/MF A01 CSCL 14/5

This study investigated, developed, and evaluated various Computer Image Generation (CIG) techniques to overcome the qualitative limitations of current CIG imaginery produced by edge-based systems. The study concluded with an integration of techniques into a system concept. This report describes the techniques investigated, the system concept developed, and the general hardware implementations which are useful for cost/benefit tradeoffs. The system concept presented is based on the use of textured terrain for realistic simulation. In areas where the technique was for training effectiveness and an algorithmically unified system. The approach also involves the display of terrain as curved surfaces represented by bicubic splines. Author (GRA)

N82-28044# Transportation Systems Center, Cambridge, Mass.
AN ANALYSIS OF SELECTED ENHANCEMENTS TO THE EN ROUTE CENTRAL COMPUTING COMPLEX Final Report, May - Sep. 1981
William Broadley, Harvey Freeman, James Olesen, Ronald Rutledge, and Kenneth Thurber Washington Sep. 1981 105 p refs
(AD-A113575; DOT-TSC-FAA-81-20) Avail: NTIS HC A06/MF A01 CSCL 09/2

This report analyzes selected hardware enhancements that could improve the performance of the 9020 computer systems, which are used to provide en route air traffic control services. These enhancements could be implemented quickly, would be relatively inexpensive, and would provide a solution to the short-term but not the long-term problems that the system faces. Three memory enhancements are discussed. First, the storage element (SE) memory boxes could be replaced. Second, the memory stacks in the SE's could be replaced. Third, the memory stacks in the input-output control elements (IOCE's) could be replaced. Three processor enhancements are discussed. First, the processors in the compute elements (CE's) could be sped up. Second, the processors in the IOCE's could be sped up. Third, the CE's could be replaced. GRA

N82-28134*# Stanford Univ., Calif. Joint Inst. for Aeronautics and Acoustics.
THE ANNOYANCE OF IMPULSIVE HELICOPTER NOISE Final Report, Jan. - Dec. 1981
K. Karamcheti Dec. 1981 27 p refs
(Grant NAG1-17)
(NASA-CR-169123; NAS 1.26:169123) Avail: NTIS HC A03/MF A01 CSCL 20A

A total of 96 impulsive and non-impulsive sounds were rated for annoyance by 10 subjects. The signals had the same amplitude spectrum with a maximum frequency of 4.75 kHz. By changing the phase of the spectral components different levels of impulsivity were obtained. The signals had coefficients of impulsivity of 10.8, 7.9, and -0.2 respectively. Further, signals had intensity levels 89 and 95 dBA, pulse repetition rates 10 and 20 Hz, and half the signals had pink noise added at a level 12 dBA lower than the level of the sound. The significant results were: The four females and six male subjects rated the impulsive sounds respectively 3.7 dB less annoying and 2.6 dB more annoying than the non-impulsive sounds. Overall, impulsivity had no effect. The hish pulse repetition rate increased annoyance by 2.2 dB. Addition of pink noise increased annoyance of the non-impulsive sounds 1.2 dB, but decreased the annoyence of the impulsive sounds 0.5 dB. T.M.

N82-28210# Clemson Univ., S.C. Dept. of Mathematical Sciences.
LEARNING AND COSTS IN AIRFRAME PRODUCTION, PART 1
Norman K. Womer and Thomas R. Gulledge, Jr. (Louisiana State Univ.) Oct. 1981 19 p refs Presented at the ORSA-TIMS Joint Natl. Meeting, Houston, Tex., 11-14 Oct. 1981
(Contracts N00014-75-C-0451; F33615-81-K5116; NR Proj. 365-049)
(AD-A112948; N131) Avail: NTIS HC A02/MF A01 CSCL 05/1

In recent years, there has been much interest in exploring the impact of learning and changes in production rate on program costs. Most researchers agree that learning is an important determinant of cost, but agreement on the cost impact of production rate changes has been less certain. Still, common sense and economic theory suggest that production rate should be an important determinant of cost. This importance is also suggested by the fact that cost penalties for production rate changes now occur in some department of defense contracts. This paper does not present a theoretical justification for the integration of learning curves with traditional neoclassical economic theory. The general theoretical framework for this paper is published in previous reserach. The purpose of this paper is to extend the range of applicability of the general framework by considering a previously unexplored specification. In particular, this paper explores the joint production situation, where learning and output are simultaneously produced, and a model is presented that has potential application in the airframe industry. The theoretical properties of the model are explored, and a cost minimizing solution is presented. Finally, a strategy is proposed for adapting the model to a particular airframe program. Author (GRA)

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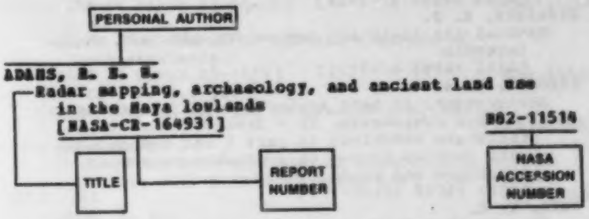

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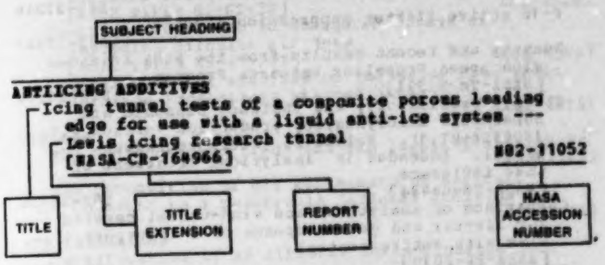
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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering -- A Continuing Bibliography* (NASA SP-7037) lists 511 reports, journal articles, and other documents originally announced in October 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

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to show the characteristics of the optimal trajectory, taking into account the optimal control features for guiding the aircraft along a particular trajectory. A description is presented of the general properties of optimal trajectories. These properties are used to solve any particular optimal trajectory which depends on the terminal conditions and the physical constraints. G.R.

A82-39399 † **Application of the sequential optimization method to the tuning of the natural frequencies of gas-turbine engine compressor blades (Primenenie metoda posledovatel'noi optimizatsii k ostroike chastot sobstvennykh kolebanii lopatok kompressora GTD).** A. B. Roitman, V. P. Afanas'ev, T. F. Mikhailova, and S. P. Omel'chenko. *Problemy Prochnosti,* July 1982, p. 86-89. 5 refs. In Russian.

The optimum tuning of the natural frequencies away from the dangerous resonance range is carried out for laterally oscillating turbine blades using the maximum blade profile thickness as the control function. The control range is limited by the tolerance on the blade geometry. A quality functional is obtained which provides a way to tune the natural frequencies with allowance for the constraints involved. V.L.

A82-39403 † **Problems in the simulation of correlation-extremal navigation systems (Problemy modelirovaniia korreliatsionno-ekstremal'nykh sistem navigatsii).** V. I. Alekseev and V. P. Tarasenko (Tomskii Institut Avtomatizirovannykh Sistem Upravleniia i Radioelektroniki, Tomsk, USSR). *Elektronnoe Modelirovanie,* vol. 4, July-Aug. 1982, p. 80-83. 9 refs. In Russian.

A general scheme for the simulation of correlation-extremal navigation systems is described, and problems of the synthesis and analysis of these systems which can be implemented through hybrid computers are examined. Applied programs developed for the simulation of correlation-extremal navigation systems are briefly characterized. B.J.

A82-39404 † **Simulation of correlation-extremal receivers of signals from sampling-phase radio-navigation systems (Modelirovanie korreliatsionno-ekstremal'nogo priemnika signalov impul'sno-fazovykh radionavigatsionnykh sistem).** I. M. Egorov and A. M. Korikov (Tomskii Gosudarstvennyi Universitet, Tomsk, USSR). *Elektronnoe Modelirovanie,* vol. 4, July-Aug. 1982, p. 84-89. 6 refs. In Russian.

The paper examines the simulation of correlation-extremal navigation systems according to radio fields created by sampling-phase radio-navigation systems. Particular attention is given to the simulation software, and the synthesis of a correlation-extremal receiver is considered for a Loran-C type system. B.J.

A82-39467 † **The use of analog computers in solutions of inverse problems of heat conduction for the identification of boundary conditions on the surfaces of gas-turbine-engine parts on the basis of temperature-measurement results (Ispol'zovanie AVM v resheniiakh obratnykh zadach teploprovodnosti dlia identifikatsii granichnykh uslovii na poverkhnostiakh detalei GTU po rezul'tatam ikh termometrirovaniia).** B. D. Bileka, V. N. Klimenko, and S. M. Chepaskina (Akademiia Nauk Ukrainskoi SSR, Institut Tekhnicheskoi Teplofiziki, Kiev, Ukrainian SSR). *Promyshlennaia Teplotekhnika,* vol. 4, July-Aug. 1982, p. 53-59. 5 refs. In Russian.

Methodological features and computational results are considered for two types of inverse problems of heat conduction: without heat removal in the inner zone and with heat removal. The first case is illustrated by the nonstationary problem of determining convective heat transfer from the gas to the stator above moving blades and to noncooled moving blades; while the second case is illustrated by the stationary problem of determining convective heat transfer from the gas to cooled nozzle blades. These two problems are treated by analog computation on the basis of the finite difference method; an implicit scheme using the Liebman method is applied to the nonstationary problem. Errors arising in the use of this approach to solve inverse heat-conduction problems are examined. B.J.

A82-39482 † **Turbulent boundary layer on a porous surface with injection at various angles to the wall (Turbulentnyi pogranichnyi sloi na poristykh poverkhnostiakh pri vduvakh pod raznymi uglami k stenke).** V. M. Eroshenko, A. A. Klimov, and L. S. Ianovskii. *Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* May-June 1982, p. 59-64. 13 refs. In Russian.

Experimental results are presented on turbulent boundary layers on porous plates in the case of uniform injection directed at various angles to the wall (15, 25, 40, 75, and 90 deg). The data disclose the influence of the intensity and angle of injection on the profiles of averaged and fluctuating velocities, characteristic thicknesses, surface friction, and turbulent shear stresses in the boundary layer. It is shown that moderate injections at angles to the flow are more effective in terms of protecting the surface than the commonly used normal-incidence injection. B.J.

A82-39539 **'Listening' systems to increase aircraft structural safety and reduce costs.** C. D. Bailey and W. M. Pless (Lockheed-Georgia Co., Marietta, GA). *Lockheed Horizons,* Summer 1982, p. 17-22.

Applications of acoustic emissions (AE) techniques to in-flight monitoring of fatigue stresses leading to parts failure is discussed. Due to inherent difficulties in designing all flows out of an aircraft, the deficiencies present in visual inspection, and the existence of many hard-to-reach critical areas, the use of AE for lifetime surveillance of potential fatigue-prone components of aircraft is offered as an effective means to prevent failure. Piezoelectric or capacitive devices are employed to detect AE originating from corrosion, stress-corrosion cracking, and crystal dislocation movements. The sensors are tuned to ranges outside of normal structural vibration and situated in areas known for potential flaws, sometimes in arrays which serve to locate a flaw through triangulation. Performance on board the KC-135 aircraft is cited as evidence for the cost-effectiveness of AE stress monitoring. M.S.K.

A82-39540 **The fourth dimension.** R. L. Heimbold and M. F. Leffler (Lockheed-California Co., Burbank, CA). *Lockheed Horizons,* Summer 1982, p. 24-30.

Problems and solutions for introduction of the Lockheed four-dimensional (4-D) flight management system (FMS) into regular airline traffic are explored. The 4-D system is operated totally by the flight management computer, which directs the plane to appropriate altitudes and speeds for minimum fuel consumption over the entire flight. The altitude is increased as fuel is consumed and the aircraft becomes lighter. Integration of the system into current air traffic involves including accurate wind data, initial estimates of arrival time and options for the flight path, a sufficient capacity for ATC control metering and spacing procedures, and accuracy of high enough order to reduce ATC workloads. Flow integration proceeds 100 mi from the airport and the necessity for a holding pattern results in a revectoring for approach once a go-around has been completed. It is noted that NWS forecasts are inadequate in terms of accuracy of available wind data. M.S.K.

A82-39718 **The technological aspects of titanium application in the TU-144 aircraft structure.** S. A. Vigdortchik and A. N. Tupolev. In: Titanium and titanium alloys: Scientific and technological aspects. Volume 3. (A82-39626 19-26) New York, Plenum Press, 1982, p. 2181-2193.

The development of techniques leading to the construction of significant portions of the TU-144 aircraft with titanium alloys is reviewed. Statistical data from experiments indicated that hydrogenation of the structural material and subsequent slow-rate failures could be controlled by vacuum low-temperature annealing, in addition to chemical milling combined with refining. The relationship of nitrogen and oxygen surface content introduced by heating, cutting, and multilayer welding to fatigue, slow-rate failure, and creep were also established statistically. Automatic inert-gas welding in sealed chambers was found to control the failure-producing elemental contents. Carbon contamination of surface layers was reduced by chemically etching and removing 0.2-0.5 mm of the surface. Finally, salt-stress corrosion was determined to be minimal in the expected operating temperatures of the titanium materials. M.S.K.

A82-39727 **Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers and Supplementary Papers.** Conference sponsored by the Royal Aeronautical Society and University of Bristol. Bristol, England, University of Bristol, 1982. Conference papers, 172 p; Supplementary papers, 57 p. (For individual items see A82-39728 to A82-39750)

Advances in system components, performance, and sensor systems of remotely piloted vehicles and unmanned vehicles are reported. The impacts and applications of RPVs on combat situations and costs are discussed, along with the various configurations of fixed wing and helicopter platforms, and Canadian, British, and U.S. efforts in RPV developmental programs. Attention is given to the various sensors which an RPV may carry, including radar, TV cameras, IR scanners, radiometers, and dead reckoning guidance systems. The design of algorithms for terrain following systems is described, as are sensor stabilization requirements and images received from remote sensors. Attention is given to the use of radio controlled aircraft in pollution studies, propulsion systems for RPVs, and image orientation for RPV ground station crew members. M.S.K.

A82-39728 # **Unmanned aircraft in future combat.** W. D. Simpson (British Aerospace Public, Ltd., Co., Dynamics Group, Stevenage, Herts., England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 2.1-2.5.

An assessment of the total effect of unmanned vehicles on armed forces is presented. The U.S. Army Aquila is noted to provide reconnaissance capability in a fixed wing aircraft form, while tethered helicopter platforms and drone dirigibles show promise of fulfilling the same needs at lower cost. Explosives delivery to targets at a distance have reached the level of cruise missiles, which are completely dependent on internal sensors and processors once launched. Similar autonomous vehicles, piston engined, can be used to jam radar, dispense chaff, and are called harassment drones. Production costs increase with the degree of sophistication of the system, including addition of IR sensors, jam-free radio, and personnel training required for control and retrieval. The autonomous systems are nominally used in large numbers and fly at high altitudes to retain line-of-sight communications. M.S.K.

A82-39729 # **Horses for courses in RPV operations.** R. G. Austin and C. J. Roberts (ML Aviation Co., Ltd., Bristol, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 3.1-3.18.

Different configurations and capacities, the increase of cost with complexity, and examples of RPVs are examined. The highest cost savings engendered by use of RPVs is noted to be the stationing of the pilot in a relatively benign environment, while additional benefits are gained from civilian applications such as crop spraying and pollution monitoring, a smaller target in combat situations, and the reduction in support crew necessary for military applications. Although the range is generally limited to a quarter mile from the controller, repeated flights may be made for photographic purposes. Operation and components of a minimal system are described, and means of extending the range, addition of a TV camera, uses of helicopter-type vehicles, and retrieval by netting are reviewed. Attention is also given to equipping RPVs for flight in severe weather, reduction of noise, shielding the RPV IR emissions, and standards for the production of RPVs. M.S.K.

A82-39730 # **Short range tactical RPH system.** M. J. Breward (Westland Helicopters, Ltd., Yeovil, Somerset, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 4.1-4.12. 5 refs.

Design features of a remotely piloted helicopter (RPH) for use in surveillance and as an observation post are discussed. The RPH is intended for use in the forward combat zone and needs high mobility, rapid deployment, flexibility of response, and rapid response. Performance requirements include all weather operation, 24-hr capability, a 10-km radius of action, a response time less than 10 min, and real time data flow. Attention is given to the sensor system with look-up ability, using low-light TV or IR scanner. The characteristics of the Wisp and Wideye RPHs are described, including payloads of 30 and 25 kg, respectively, and all up weights of 125 and 85 kg. Command links are achieved with low frequency transmissions lasting short periods, with 30-60 sec intervals of silence. Dead reckoning with meteorological input alone is recommended for overcoming the dangers of ECM. M.S.K.

A82-39731 # **Canadair rotary wing technology development.** A. S. Clark (Canadair, Ltd., Montreal, Canada). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 5.1-5.13.

Design, performance, and operational features of the Canadair CL-227 rotary wing RPV are detailed. The CL-227 is intended as a surveillance and target acquisition system transmitting in real time, operating in the short-to-medium range battlefield locations, and controlled by mobile units. A rotary winged configuration permits take-off from unprepared ground and hovering over target areas. The vehicle is modular in design, comprising power, rotor, and control units. A Wankel engine has been successfully employed during testing, and rotor blades are made of Kevlar with a foam core. The control module contains sensor and telemetry equipment for microwave relay and operation with four degrees of freedom. Attention is given to the development of a transfer function suitable for maintaining the aerodynamic stability of the vehicle. A total of 300 flights had been performed by 1980, and test procedures are described. M.S.K.

A82-39732 # **U.S. Army remotely piloted vehicle program.** J. K. Marstiller (U.S. Army, Aviation Research and Development Command, St. Louis, MO). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 6.1-6.5.

The U.S. Army full scale engineering development program for the Aquila RPV is described. Aquila is intended as an artillery aid to provide target acquisition, permit first round fire for effect, allow artillery adjustment, and provide designation for laser guided projectiles out to maximum artillery range. The entire system comprises the air vehicle, a ground control station, remote ground terminal, a hydraulic catapult launcher, a net type recovery subsystem, and support equipment. Aquila is launched 10-15 km on the friendly side of combat lines and flight is governed by preprogrammed internal commands covering waypoints, with loiter or jinking modes available by remote control, received in burst form. The vehicle carries a stabilized TV sensor with laser rangefinder/designator, and is constructed to survive in nuclear, ballistic, and chemical environments, and in worldwide climatic conditions. Operational testing is scheduled for 1982. M.S.K.

A82-39733 # **Stabileye.** R. Stephenson (British Aerospace Public, Ltd., Co., Dynamics Group, Bristol, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 7.1-7.12. 6 refs.

Performance, design, and materials characteristics of the Stabileye RPV, which is used to define applications of RPVs, are detailed. The Stabileye has progressed through three versions, each featuring a twin-boom pusher engine layout, with the most recent, the MK.3, carrying a maximum payload of 25 kg, a 50 m/sec or less top speed, and flight duration of one hour. The MK.3 was constructed to examine the effectiveness of glass reinforced plastics and honeycomb core material for the fuselage, bulkheads, nose and rear body fairings, and the top lid, which conceals the payload and recovery parachute. The wing is a NACA 4415 profile made of hot-wire cut polystyrene foam with multiple hardwood spars and wood veneer/glass reinforced plastic skins. A two-cylinder, 7-hp power plant is interfaced with a pulse code modulated system. The primary sensor is a vertical gyroscope, with flight control electronics, a yaw rate gyro, and a telemetry encoder. M.S.K.

A82-39734 # **The national dynamics 'observer' mini-RPV for tropical operation.** M. Reed (Natal, University, Durban, Republic of South Africa). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 9.1-9.9. 7 refs.

Results of testing program of a mini-RPV for civil and military applications in South Africa are reported. The airframe was fabricated using epoxy resin/fiberglass and fire-retard low density styrofoam. A two-stroke engine was chosen, developing 22.6 hp at 7200 rpm and a four-bladed propeller for reasons of maintaining engine speed. Launch is from the roof of a car and power for servo-units is derived from nickel-cadmium battery packs. Program goals for additional development of a rhombic-wing mini-RPV are outlined. M.S.K.

A82-39735 # **MACHAN - A unmanned aircraft flight research facility.** T. G. Hamill (Marconi Avionics, Ltd., Rochester, Kent, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 10.1-10.8. Research supported by the Ministry of Defence (Procurement Executive).

The purpose of this paper is to introduce the MACHAN programme, or to give it it's full name, 'the provision of an unmanned aircraft flight research facility'. This programme is funded by MOD(PE) with a substantial PV input from Marconi Avionics. The 3 aspects of the programme covered are the aircraft itself, the supporting facilities and, here, specifically the ground station, and the programme of experimental flying and payload trials as it is currently envisaged. (Author)

A82-39736 # **Mini-RPV propulsion.** L. A. Kolbo (Kolbo Corp., Anaheim, CA). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 13.1-13.4.

Mini-RPV propulsion systems which can deliver flight durations of four hours at speeds between 100 and 200 kn are reviewed. The reciprocating internal combustion engine is the favored choice because of fuel density, noise, heat signature, and fuel consumption characteristics. A two-cylinder configuration is the most satisfactory choice due to lightness, carburation, and simplicity. The engine components are preferably made of aluminum, chromium, and aluminum-magnesium alloys to preserve weight-saving design goals and heat-tolerant properties. It is recommended that mini-RPVs have a specific fuel consumption of 0.8, with an aneroid barometer-equipped carburetor in order to adjust fuel-air mixtures for height automatically. An ignition system which delivers 40,000 V open circuit is described, and features of propellers are discussed in terms of performance and material considerations. M.S.K.

A82-39737 # **The application of small propellers to RPV propulsion.** A. C. Roberts (British Aerospace Public, Ltd., Co., Dynamics Group, Bristol, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 14.1-14.10.

Progress in the development of a data base for construction of propellers for increasing the range and performance of small unmanned aircraft is assessed. Compromises are necessary in design of propellers due to different requirements during climb and dash flight modes, and options for areas to explore include diameter and number of blades. Restrictions include resulting size of the radar target produced, the effect on forward looking sensors, recovery method, and noise. Small RPV propellers operate in the middle of the critical Reynolds number flow regime, encountering both laminar and turbulent flows while turning at 6000-8000 rpm. A numerical model is developed for optimizing propeller efficiency and a computer program is outlined for predicting performance. Wind tunnel tests of 0.5 m diam fixed-pitch 2-blade propellers showed that current predictions degrade in accuracy with increases in forward speed. M.S.K.

A82-39738 # **The control and guidance unit for MACHAN.** I. F. Cooper and J. A. Birkenshaw (Marconi Avionics, Ltd., Rochester, Kent, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April

Current NASA research points toward exciting opportunities for large reductions in viscous drag. Research is underway on natural laminar flow, laminar flow control by suction, and turbulent drag reduction. Preliminary results suggest that a significant amount of natural laminar flow can be achieved on small, straight-wing airplanes. On larger, swept-wing aircraft, laminar flow control by distributed suction is expected to result in significant fuel savings. The area over which laminar flow control is applied depends on tradeoffs involving structural complexity, maintenance, and cost. Several methods of reducing turbulent skin friction by altering the turbulence structure itself have shown promise in exploratory testing. This paper reviews the status of these technologies and indicates the benefits of applying them to future aircraft. (Author)

A82-40897 # Viscous transonic airfoil flow simulation. J. Longo, W. Schmidt (Dornier GmbH, Friedrichshafen, West Germany), and A. Jameson (Dornier GmbH, Friedrichshafen, West Germany; Princeton, University, Princeton, NJ). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 214-223. 19 refs.

The present paper describes a method for the calculation of subsonic and transonic viscous flow over airfoils using the displacement surface concept. This modelling technique uses a fast multigrid solver for the full potential equation and laminar and turbulent boundary layer integral methods. In addition, special models for transition, laminar or turbulent separation bubbles and trailing edge treatment have been selected. However, the flow is limited to small parts of trailing edge-type separation. The present paper deals with some theoretical features in a short description and shows computed results compared with experimental data and other methods. (Author)

A82-40898 # Computation of supersonic flow around three-dimensional wings. B. G. Arlinger (Saab-Scania AB, Linkoping, Sweden). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 224-232. 16 refs.

As part of the development of a program for supersonic flow around realistic aircraft configurations a method is presented for the computation of strictly supersonic flow around single wings or two-wing configurations of arbitrary shape. The method is based on the steady Euler equations which are solved in a streamwise marching procedure using a shock-capturing finite volume formulation. As solution algorithm an explicit predictor-corrector scheme of MacCormack type is used. A variety of numerical applications of the method is presented including canard configuration cases, and comparisons are made with other theories and test data confirming versatility and reliability of the method. (Author)

A82-40899 # Transonic small disturbance code for body-wing configuration coupled with full potential code for wing alone. A. Luntz (Israel Aircraft Industries, Ltd., Lod, Israel). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 233-237. 7 refs.

A transonic small disturbance approximation code TSD was designed, for potential flow around a body-wing configuration. This code is based on the embedded fine grid concept elaborated by Ch. Boppe. Improvements are introduced into the boundary condition representation, including the body boundary condition, the wing boundary condition and the interface between the fine grid box and the coarse grid computation. Only cartesian coordinate grids are used. The code provides good prediction of the position of the shock on the wing surface, using a comparatively small number (about 20) of grid points along the wing section cord. The TSD code is coupled with a modified (no crossflow at the wing root plane) in FL022, is replaced with the crossflow values computed by the TSD code. This new boundary condition, at the wing root, contains all information of the body influence needed for the wing pressure computation. The coupling allows detailed analysis of the body-wing interference effects in the flow. (Author)

A82-40900 # Advanced fighter technology integration program AFTI/F-16. A. J. Bianco and F. R. Swortzel (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 238-246.

The AFTI/F-16 Advanced Development Program is developing and flight validating advanced technologies which improve fighter lethality and survivability. The capability is achieved by the integration of mission task-tailored, digital flight controls with a director-type fire control system, and advanced target sensor/-trackers. The Digital Flight Control System is the core technology. Integration of the systems forms the capability for automated maneuvering attack. Evaluation of automation, with respect to the weapon delivery task, is a key program thrust. Use is made of nonconventional aircraft control modes to achieve improved maneuverability and weapon line pointing. Careful attention is given to pilot/vehicle interface provisions. The AFTI/F-16 is now undergoing an extensive test program to provide the confidence necessary to transition the technologies for use on current and future fighter aircraft. (Author)

A82-40901 # Tail versus canard configuration - An aerodynamic comparison with regard to the suitability for future tactical combat aircraft. G. Wedekind (Dornier GmbH, Friedrichshafen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 247-254.

Extensive experimental and theoretical research work on tail and canard configurations has recently been done at Dornier, considering the requirements for a future tactical combat aircraft. Tail and canard configurations, which were designed for the same tactical requirements, are compared. This comparison leads to the conclusion that the canard configuration cannot be regarded superior to the tail configuration, neither with regard to zero-lift drag at supersonic speeds nor with regard to lift-dependent drag at subsonic and supersonic speeds. Furthermore, severe problems must be expected regarding lateral and directional stability at high angles-of-attack for a canard configuration. It turns out that those problems do not occur or are easier to handle with tail configurations. (Author)

A82-40902 # Material and process developments on the Boeing 767. J. T. Quinlivan and D. T. Lovell (Boeing Commercial Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 255-261.

The design goal of the 767 is an economic service life of 20 years with minimum unscheduled maintenance. Materials, material processing, and assembly methods employed on the 767 play a key role in the achievement of this design goal. Materials and processes also are key in maintaining weight within design limits for fuel efficiency. The 767 uses a wealth of new and improved materials, processing methods, and assembly techniques. Some of the innovations are subtle and involve minor changes to previous technology, such as the reduction of certain fastener head diameters. Others are more dramatic, such as the use of new aluminum alloys for wing skins or advanced composites for primary flight-control surfaces. Corrosion resistance is achieved through material selection, attention to design details, and proper finishing and sealing methods. For the most part, the materials selected for the passenger cabin interior are new and are selected for their flame resistance and lack of smoke and toxicant emission during combustion. A review of major structural and nonstructural material and process developments on the 767 will be summarized in this paper. (Author)

A82-40903 # The promise of laminated metals in aircraft design. D. H. Petersen, L. E. Sloter, II, W. A. Poindexter, J. L. Maris, and G. E. Kuhn (Vought Corp., Dallas, TX). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 262-269. 8 refs.

The relative merits of monolithic metals, adhesively bonded sheet metal and a new family of metallurgically bonded laminated alloys are presented and discussed in light of the U.S. Air Force's laminated metal technology demonstration Advanced Technology Wing program. A wing section was designed and constructed whose lower skin consisted of adhesively bonded aluminum layers having no fastener penetrations. The elimination of lower wing skin fasteners precludes both corrosion intrusion sites and locations for structural cracking, and in addition reduces manufacturing and assembly costs. The wing suffered no damage during two lifetimes of spectrum fatigue testing, as well as an additional 1.8 lifetimes of damage tolerance testing which included exposure to sump water and JP-4 fuel. O.C.

A82-40904 # Design of compensated flutter suppression systems. M. Lanz and P. Mantegazza (Milano, Politecnico, Milan, Italy). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 270-279. 37 refs. Consiglio Nazionale delle Ricerche *Contract No. 81,02536,07.*

The paper presents a method to design compensated flutter suppression systems by eigenvalue assignment. The compensator is designed as a state observer by paralleling the Luenberger approach. The eigenvalues of the aeroelastic system and compensator are obtained by imposing a stationary value to a suitable norm of the gains, under the constraint of satisfying the aeroelastic eigensystem for assigned stable eigensolutions, and without any problem on the modelling of the unsteady aerodynamic forces. The compensator can be used not only to reconstruct lacking states, but also to insure insensitivity to different flight conditions. A method is presented to mechanize, and possibly to reduce in order, the aeroelastic observer. Some simple examples illustrate the use of the method along with comments on the stabilization of an aeroelastic system by eigenvalue assignment techniques. (Author)

A82-40905 # **Design and experience with a low-cost digital fly-by-wire system in the SAAB JA37 Viggen A/C.** K. Folkesson, P. O. Elgerona, and R. Haglund (Saab-Scania AB, Linkoping, Sweden). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 280-288. Research supported by the Forsvarets Materielverk.

A digital Fly-By-Wire system has been designed built and evaluated as a rig system and as a flight system installed in a JA37 Viggen test aircraft. Headlines for definition of the system have been low complexity and low production cost, met by trading off complexity against safety and reliability margins. System characteristics are minimized servo hardware, minimized channel interconnections and maximum replacement of hardware by software including servo loop closures. Functional development areas are application of optimal control technique for multimode laws and for servo loop computations. The paper will present system definition, system mechanization in test aircraft, ground test and flight test information. (Author)

A82-40906 * # **Design and flight testing of a digital optimal control general aviation autopilot.** J. R. Broussard (Information and Control Systems, Inc., Hampton, VA), D. R. Downing (Kansas, University, Lawrence, KS), and W. H. Bryant (NASA, Langley Research Center, Flight Control Systems Div., Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 289-298. 12 refs. Contract No. NAS1-16303.

This paper presents the designs of Proportional-Integral-Filter (PIF) autopilots for a General Aviation (NAVION) aircraft. The PIF autopilots use modern control theory to determine heading select and altitude select and hold autopilot modes. The PIF control law uses typical General Aviation sensors for state feedback; command error integration for command tracking; digital complimentary filtering and analog prefiltering for sensor noise suppression; a control filter for computation delay accommodation; and the incremental form to eliminate trim values in implementation. Theoretical developments for the control law are described which combine the sampled-data regulator with command generator tracking for use as a digital flight control system. The digital PIF autopilots are evaluated using closed-loop eigenvalues and simulations. Successful flight test results for the PIF autopilots are presented for different turbulence conditions and quadratic weights. (Author)

A82-40907 # **Preliminary design of an advanced integrated power and avionics information system.** G. L. Dunn, P. Leong (Boeing Military Airplane Co., Seattle, WA), and D. Fox (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 299-305. Contract No. F33615-80-C-2004.

An advanced aircraft electrical system is described which meets the requirements for a 1990 time frame two-engine tactical aircraft with multimission capability. It features modular design and use of intelligent electrical load management centers with solid state power controllers, resulting in a greatly enhanced aircraft electrical system over that currently available. The power generation and distribution, electrical power control, multiplex data bus characteristics, power system processor, electrical load management center, generator control unit, and electrical system software are discussed and diagrammed. C.D.

A82-40908 * # **Inlet and airframe compatibility for a V/STOL fighter/attack aircraft with top-mounted inlets.** D. A. Durston and D. B. Smeltzer (NASA, Ames Research Center, Moffett Field, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 305/a-305/i. 9 refs.

Aerodynamic force and inlet-pressure data were obtained for 9.5% force and pressure models of a V/STOL fighter/attack aircraft configuration with top-mounted twin inlets. Data are presented from wind tunnel tests conducted at Mach numbers of 0.6, 0.9, and 1.2 at angles of attack up to 27-deg and angles of sideslip up to 12-deg. Trimmed aerodynamic characteristics and inlet performance were compared for three different leading-edge extension (LEX) configurations. The effects of wing leading- and trailing-edge flaps on the inlet were also determined. Maneuver performance was calculated from combined force and inlet-pressure data. The largest of the three LEX sizes tested gave the best airplane maneuver performance. Wing flap deflections improved inlet recovery at all Mach numbers. (Author)

A82-40909 # **Investigation of the unsteady airloads on a transport aircraft type airfoil with two interchangeable oscillating trailing edge flaps, at transonic speed and high Reynolds numbers.** H. Triebstein (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Gottingen, West Germany), R. Destuynder (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France), and H. Hansen (Messerschmitt-Bölkow-Blohm GmbH, Hamburg, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 306-315. 8 refs. Research supported by the Bundesministerium für Forschung und Technologie.

Investigations in unsteady aerodynamics were conducted in order to study the potential of active control technology for transport aircraft wings. Wind tunnel tests were carried out using a large two-dimensional model with two interchangeable, fast moving, trailing edge control surfaces of different relative chord. The subsonic and supercritical pressure distributions were studied, and the unsteady aerodynamic coefficients were analyzed. It is found that in subsonic flow trailing edge separation causes considerable reduction in steady lift, but there is far less influence on the magnitude of the unsteady lift generated by an oscillating control surface. Only the corresponding phase angle changes dramatically. In transonic flow the development of the supersonic region and the shock strength and location demonstrate a predominant influence on steady as well as unsteady pressure distributions. The properties of the supersonic regions and the shocks change considerably with all parameters investigated. C.D.

A82-40910 # **Determination of the efficiency of a trailing edge flap in unsteady three-dimensional flow (Détermination de l'efficacité d'un volet de bord de fuite en écoulement tridimensionnel instationnaire).** H. Consigny (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 316-328. 18 refs. In French. Research supported by the Direction des Recherches, Etudes et Techniques and Ministère de la Défense.

A study was carried out in order to improve understanding of the three-dimensional unsteady effects of an oscillating part-span trailing-edge flap. The experiments were performed on a constant chord and constant thickness supercritical wing mounted on the sidewall of a transonic wind tunnel. The model was fitted with some 236 static pressure taps and 136 small unsteady pressure transducers located on several spanwise stations. The measurements made for different geometric configurations provided extensive information on the influence of various parameters on both steady and unsteady chordwise pressure distributions and aerodynamic coefficients. The experimental results were compared with those obtained by theoretical methods based on the solution of the full potential equation in steady flow and on the classical transonic small disturbances equation in unsteady flow. Quasi-steady pressure distributions were also compared to preliminary computational results, including viscous effects. C.D.

A82-40911 * # **An investigation of scale model testing of VTOL aircraft in hover.** W. G. Hill, Jr., R. C. Jenkins (Grumman Aerospace Corp., Bethpage, NY), and M. R. Dudley (NASA, Ames Research Center, Moffett Field, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 329-335. 6 refs. Contract No. NAS2-10645.

Utilizing the unique opportunity created by full scale hover testing of the twin-jet Grumman Design 698 VTOL aircraft in the NASA-Ames Hover Facility, a series of experiments was conducted to evaluate the effectiveness of scale model testing in predicting full scale behavior. Interference forces were found to be sensitive to aircraft lower surface geometry, but when the geometry was modeled accurately the small scale results matched full scale forces quite well. The interference forces were found to be insensitive to core nozzle temperature and fan nozzle pressure ratio. The results clearly demonstrate that small scale models can be reliably utilized for aircraft and technology development when the appropriate sensitivities are recognized. (Author)

A82-40912 # **Optimization of flight with tilt wings (Optimisation du vol à aile battante).** P. Contensou (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 336-341. In French.

Within a structure of simplifying assumptions, a complete solution is presented for the problem of optimizing a tilted flying surface by establishing the law of motion relative to a mobile wing and determining the functions of lift and propul-

STAR ENTRIES

N82-28243*# Lockheed-California Co., Burbank.
ELECTRONIC/ELECTRIC TECHNOLOGY BENEFITS STUDY Report, Aug. 1980 - Jan. 1982
W. W. Howison and M. J. Cronin May 1982 226 p
(Contract NAS1-16199)
(NASA-CR-165890; NAS 1.26:165890; LR-30079) Avail: NTIS HC A11/MF A01 CSCL 01B

The benefits and payoffs of advanced electronic/electric technologies were investigated for three types of aircraft. The technologies, evaluated in each of the three airplanes, included advanced flight controls, advanced secondary power, advanced avionic complements, new cockpit displays, and advanced air traffic control techniques. For the advanced flight controls, the near term considered relaxed static stability (RSS) with mechanical backup. The far term considered an advanced fly by wire system for a longitudinally unstable airplane. In the case of the secondary power systems, trades were made in two steps: in the near term, engine bleed was eliminated; in the far term bleed air, air plus hydraulics were eliminated. Using three commercial aircraft, in the 150, 350, and 700 passenger range, the technology value and pay-offs were quantified, with emphasis on the fiscal benefits. Weight reductions deriving from fuel saving and other system improvements were identified and the weight savings were cycled for their impact on TOGW (takeoff gross weight) and upon the performance of the airframes/engines. Maintenance, reliability, and logistic support were the other criteria. Author

N82-28244# Federal Aviation Administration, Washington, D.C. Office of Management Systems.
GENERAL AVIATION ACTIVITY AND AVIONICS SURVEY Annual Report
Judith C. Schwenk Dec. 1981 205 p refs
(AD-A112924; FAA-MS-81-5) Avail: NTIS HC A10/MF A01 CSCL 01/2

This report presents the results and a description of the 1980 General Aviation Activity and Avionics Survey. The survey was conducted during 1981 by the FAA to obtain information on the activity and avionics of the United States registered general aviation aircraft fleet, the dominant component of civil aviation in the U.S. The survey was based on statistically selected sample of about 14.0 percent of the general aviation fleet and obtained a response rate of 65 percent. Survey results are based upon responses but are expanded upward to represent the total population. Survey results revealed that during 1980 an estimated 41.0 million hours of flying time were logged by the 211,045 active general aviation aircraft in the U.S. fleet, yielding a mean annual flight time per aircraft of 190.5 hours. The active aircraft represented about 83 percent of the registered general aviation fleet. The report contains breakdowns of these and other statistics by manufacturer/model group, aircraft type, state and region of based aircraft, and primary use. Also included are fuel consumption, lifetime airframe hours, avionics, and engine hours estimates. Author (GRA)

N82-28245# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
INTERNATIONAL AVIATION (SELECTED ARTICLES)
12 Apr. 1982 23 p Transl. into ENGLISH from Guoji Hangkong (Communist China), no. 224, Oct. 1981 p 2-9, 49
(AD-A114422; FTD-ID(RS)T-0027-82) Avail: NTIS HC A02/MF A01 CSCL 21/5

Chinese made goods were exhibited, including aeronautical forgings, castings, forging dies, casting molds, powder metallurgical products, and titanium alloys and products. These goods symbolize China's production capability and technical level of aeronautical forgings and castings, with excellent qualities of these products. S.L.

N82-28249*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A SUMMARY OF V/STOL INLET ANALYSIS METHODS
Danny P. Hwang and John M. Abbott 1982 17 p refs To be presented at the 13th Congr. of the Intern. Council of the Aeronautical Sci. and Aircraft Systems and Technol. Conf., Seattle, 22-27 Aug. 1982; sponsored by the American Inst. of Aeronautics and Astronautics Previously announced in IAA as A82-16902
(NASA-TM-82885; E-1263; NAS 1.15:82885) Avail: NTIS HC A02/MF A01 CSCL 01A

For abstract see A82-16902.

N82-28252*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AERODYNAMIC INTERACTIONS BETWEEN A 1/6 SCALE HELICOPTER ROTOR AND A BODY OF REVOLUTION
Mark D. Betzina and Patrick Shinoda Jun. 1982 15 p refs Prepared in cooperation with Army Research and Technology Labs., Moffett Field, Calif.
(NASA-TM-84247; A-8940; NAS 1.15:84247) Avail: NTIS HC A02/MF A01 CSCL 01A

A wind-tunnel investigation was conducted in which independent, steady state aerodynamic forces and moments were measured on a 2.24-m-diam. two bladed helicopter rotor and a body of revolution. The objective was to determine the interaction of the body on the rotor performance and the effect of the rotor on the body aerodynamics for variations in velocity, thrust, tip-path-plane angle of attack, body angle of attack, rotor/body position, and body nose geometry. Results show that a body of revolution near the rotor can produce significant favorable or unfavorable effects on rotor performance, depending on the operating condition. Body longitudinal aerodynamic characteristics are significantly modified by the presence of an operating rotor and hub. Author

N82-28260# Systems Research Labs., Inc., Dayton, Ohio.
WIND-TUNNEL EVALUATION OF AN AEROELASTICALLY CONFORMABLE ROTOR Final Report
Lawrence R. Sutton, Richard P. White, Jr., and Robert L. Marker Mar. 1982 87 p refs
(DA Proj. 1L2-62209-AH-76)
(AD-A114384; USAAVRADCOM-TR-81-D-43) Avail: NTIS HC A05/MF A01 CSCL 01/3

This report summarizes the theoretical and experimental investigations that were conducted to evaluate the potential of aeroelastic and mass-elastic couplings in an aerolastic conformable rotor (ACR) that will improve the performance and vibratory characteristics of helicopter rotor systems without creating instabilities. ACR parameters were identified and a baseline rotor system was selected. An ACR blade concept was investigated by altering the characteristics of the baseline and using automated analysis techniques. GRA

N82-28261# Army Aviation Research and Development Command, St. Louis, Mo. Applied Technology Lab.
NATIONAL TRANSONIC FACILITY (NTF) PROTOTYPE FAN BLADE FATIGUE TEST Progress Report, Jan. - Mar. 1981
E. H. Dean, A. J. Gustafson, and D. M. Saylor Mar. 1982 18 p
(DA Proj. 1L1-62209-AH-76)
(AD-A114405; USAAVRADCOM-TR-82-D-5) Avail: NTIS HC A02/MF A01 CSCL 14/2

The Applied Technology Laboratory conducted fatigue tests on a composite fan blade designed for use in the new NTF wind tunnel being constructed at NASA-Langley. The tests were performed by the Structures Technical Area using the root end fatigue machine (REFM), which was modified for ground-air-ground testing. Simulated centrifugal and aerodynamic (bending) load tests were performed. The fan blade successfully withstood 6000 cycles at 360 rpm and 600 rpm load conditions for the cyclic rate tests. These tests simulated the starting and stopping cycles of the fan. Static load tests to 57,000 pounds design load were also successfully performed on the blade specimen. Author (GRA)

N82-28262# National Aerospace Lab., Amsterdam (Netherlands) Fluid Dynamics Div.
EVALUATION OF AN EXPERIMENTAL TECHNIQUE TO INVESTIGATE THE EFFECTS OF THE ENGINE POSITION ON ENGINE/PYLON/WING INTERFERENCE
J. A. J. vanEngelen, B. Munniksma, and A. Elsenaar 28 Apr. 1981 16 p refs Presented at AGARD Symp. on Aerodyn. of Power Plant Installation, Toulouse, 11-14 May 1981
(NLR-MP-81020-U) Avail: NTIS HC A02/MF A01

Free flow and blown nacelle wind tunnel testing of engine airframe integration are compared, and the magnitude of the parasitic interference of an additional strut and engine inlet fairing

Benefits and costs expected to accrue from a terminal information display system (TIDS) are analyzed. TIDS is an electronic data processing system intended to replace (1) present flight data entry and printing equipment and (2) several devices currently used to display meteorological and operational information within towers and terminal radar control facilities. A description of the terminal information display system is presented. Major sources of both quantifiable and nonquantifiable benefits are discussed. It is shown that the installation of TIDS would improve terminal controller productivity by ten to fifteen percent and would result in a substantial reduction in maintenance costs. Information in present value (1981) dollars for the equipment life cycle is presented. Over the twenty year service life of TIDS, the analysis indicates that the benefit/cost ratio is 1.74 and the net present value of savings by installing TIDS at thirty major terminal facilities is about $26 million. GRA

N82-29292# Applied Geophysics, Inc., Salt Lake City, Utah.
GEOPHYSICAL FLIGHT LINE FLYING AND FLIGHT PATH RECOVERY UTILIZING THE LITTON LTN-76 INERTIAL NAVIGATION SYSTEM
A. F. Mitkus, Dwight Cater, Patrick F. Farmer, and S. Parker Gay, Jr. Nov. 1981 177 p refs Prepared for High Life Helicopter, Inc.
(Contract DE-AC13-79GJ-01692)
(DE82-005555; GJBX-363-81) Avail: NTIS HC A09/MF A01

The Litton LTN-76 Inertial Navigation Systems (INS) with Inertial Track guidance system software is geared toward the airborne survey industry. This report is a summary of tests performed with the LTN-76 designed to fly an airborne geophysical survey as well as to recover the subsequent flight path utilizing INS derived coordinates. DOE

N82-29293# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HUMAN FACTORS IN AIR TRAFFIC CONTROL
V. David Hopkin (Royal Air Force Inst. of Aviation Medicine) Apr. 1982 187 p refs
(AGARD-AG-275; ISBN-92-835-1421-1) Avail: NTIS HC A09/MF A01

Human factors are related to air traffic control, air traffic control systems, the physical surroundings, equipment, and operation of the system, and the selection, development, training and evaluation of air traffic controllers. For individual titles, see N82-29294 through N82-29310.

N82-29294# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE AIR TRAFFIC CONTROL SYSTEM
In its Human Factors in Air Traffic Control Apr. 1982 p 3-9
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

Principles and practices of air traffic control are described. The information influencing the air traffic control system and the information available to the controller are summarized and defined. The users of air traffic control, whether commercial, military, or general aviation traffic is considered, are categorized, and their responsibilities discussed. Interactions between air traffic control and the pilot are considered. National and regional variations in the problems and practices of air traffic control are described. J.D.

N82-29295# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HUMAN FACTORS CONTRIBUTIONS TO AIR TRAFFIC CONTROL SYSTEMS
In its Human Factors in Air Traffic Control Apr. 1982 p 10-21
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The role of the human factors specialist in air traffic control systems operations and planning is analyzed. Man-machine interactions: the contribution of human factors engineering to system design, the implementation and testing of air traffic control systems and tasks, and the evolution of air traffic control systems; and the educational role of human factors specialists as applied to air traffic control are considered. J.D.

N82-29296# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
MAN AS A SYSTEM COMPONENT
In its Human Factors in Air Traffic Control Apr. 1982 p 22-30
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The air traffic controller is considered as a component of a man-machine system. Limitations of this approach are considered. The allocation of functions, the effects of automation and computer assistance, the man-machine interface, and human reliability are discussed. J.D.

N82-29297# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
HUMAN CAPABILITIES AND LIMITATIONS IN SYSTEMS
In its Human Factors in Air Traffic Control Apr. 1982 p 31-46
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

Human capabilities and limitations which restrict the development of air traffic control systems are discussed. Sensory factors, perception, learning, memory, capacity for attention, information processing, understanding, problem solving, decision making, and motivation are considered. Common mismatches of system requirements with human capabilities are described. J.D.

N82-29298# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
JOBS AND TASKS IN AIR TRAFFIC CONTROL
In its Human Factors in Air Traffic Control Apr. 1982 p 47-52
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

Jobs and tasks are discussed. The required content of job descriptions and their application to allocation of jobs is considered. Task analysis and task synthesis, task grouping, interactions between tasks, and workloads are described. J.D.

N82-29299# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
THE WORK ENVIRONMENT
In its Human Factors in Air Traffic Control Apr. 1982 p 53-62
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The work environment for all traffic control tasks is considered. Principles of workspace design are discussed. The physical environment, suites and consoles, air traffic control centers and control rooms, and air traffic control towers are described. J.D.

N82-29300# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
DISPLAYS
In its Human Factors in Air Traffic Control Apr. 1982 p 63-78
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

Factors affecting interactions between visual displays and their users are discussed. The physical dimensions of the display, the layout of the display and of information within the display, the information content of the display, visual codings and color codings, the legibility and readability of displays, the relation between displays, and the quality of displayed information are considered. New display technology is summarized. J.D.

N82-29301# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
CONTROLS
In its Human Factors in Air Traffic Control Apr. 1982 p 79-84
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The location, type, sensitivity, and interactions of the controls used by the human to convey information to the air traffic control system are discussed. The relationships between controls and visual displays are considered. J.D.

N82-29302# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
COMMUNICATIONS
In its Human Factors in Air Traffic Control Apr. 1982 p 85-93
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The human factor terms of communication in air traffic control are examined. The effects of known specified variables in communications on controller performance or system efficiency were measured. The importance of speech and the use of computers in the man machine systems as a means of dialogue and information transmission is emphasized. The following topics are discussed: transmission of information between air and ground; speech as a medium of communication; qualitative attributes of speech; automated speech recognition and automated speech synthesis; coordination and liaison; language and terminology of air traffic control; air traffic phrasing and message formats; information quantification and redundancy in air traffic control messages. E.A.K.

N82-29309# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

ADDITIONAL FUNCTIONS WITHIN THE AIR TRAFFIC CONTROL SYSTEM

In its Human Factors in Air Traffic Control Apr. 1982 p 150-153
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

The application of human factors engineering to other job functions existing within the air traffic control system is discussed. Personnel involved in data gathering, maintenance of system integrity, fault finding, supervision, and traffic control assistance are considered. J.D.

N82-29310# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

FUTURE TRENDS AND PROBLEMS

In its Human Factors in Air Traffic Control Apr. 1982 p 154-155
(For primary document see N82-29293 20-04)
Avail: NTIS HC A09/MF A01

Anticipated developments and problems occurring in the application of human factors engineering to air traffic control systems, particularly in the light of technological advances in hardware and software, are summarized. J.D.

N82-29311*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ESTABLISHMENT OF A ROTOR MODEL BASIS

R. E. McFarland Jun. 1982 93 p refs Prepared in cooperation with Army Aviation Research and Development Command, Moffett Field, Calif.
(NASA-TP-2026; A-8605; NAS 1.60:2026;
AVRADCOM-TR-81-A-14) Avail: NTIS HC A05/MF A01 CSCL 01C

Radial-dimension computations in the RSRA's blade-element model are modified for both the acquisition of extensive baseline data and for real-time simulation use. The baseline data, which are for the evaluation of model changes, use very small increments and are of high quality. The modifications to the real-time simulation model are for accuracy improvement, especially when a minimal number of blade segments is required for real-time synchronization. An accurate technique for handling tip loss in discrete blade models is developed. The mathematical consistency and convergence properties of summation algorithms for blade forces and moments are examined and generalized integration coefficients are applied to equal-annuli midpoint spacing. Rotor conditions identified as 'constrained' and 'balanced' are used and the propagation of error is analyzed. Author

N82-29312*# Cincinnati Univ., Ohio. Dept. of Aerospace Engineering and Applied Mechanics.

FLAP-LAG-TORSIONAL DYNAMICS OF EXTENSIONAL AND INEXTENSIONAL ROTOR BLADES IN HOVER AND IN FORWARD FLIGHT Semiannual Progress Report, Jan. - Jun. 1982

Crespo DaSilva Jun. 1982 72 p refs
(Grant NAG2-38)
(NASA-CR-169159; NAS 1.26:169159) Avail: NTIS HC A04/MF A01 CSCL 01C

The reduction of the O(cu epsilon) integro differential equations to ordinary differential equations using a set of orthogonal functions is described. Attention was focused on the hover flight condition. The set of Galerkin integrals that appear in the reduced equations was evaluated by making use of nonrotating beam modes. Although a large amount of computer time was needed to accomplish this task, the Galerkin integrals so evaluated were stored on tape on a permanent basis. Several of the coefficients were also obtained in closed form in order to check the accuracy of the numerical computations. The equilibrium solution to the set of 3n equations obtained was determined as the solution to a minimization problem. S.L.

N82-29313*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THE FEASIBILITY OF A HIGH-ALTITUDE AIRCRAFT PLATFORM WITH CONSIDERATION OF TECHNOLOGICAL AND SOCIETAL CONSTRAINTS Thesis - Kansas Univ.

Ernald B. Graves Jun. 1982 250 p refs
(NASA-TM-84508; NAS 1.15:84508) Avail: NTIS HC A15/MF A01 CSCL 01C

The feasibility of remotely piloted aircraft performing year around missions at an altitude of 70,000 feet is determined. Blimp and airplane type vehicles employing solar-voltaic, microwave, or nuclear propulsion systems were considered. A payload weighing 100 pounds and requiring 1000 watts of continuous power was assumed for analysis purposes. Results indicate that a solar powered aircraft requires more solar cell area than is available on conventional aircraft configurations if designed for the short days and high wind speeds associated with the winter season. A conventionally shaped blimp that uses solar power appears feasible if maximum airspeed is limited to about 100 ft/s. No viable airplane configuration that uses solar power and designed to withstand the winter environment was found. Both a conventionally shaped blimp and airplane appear feasible using microwave power. Nuclear powered aircraft of these type are also feasible. Societal attitudes toward the use of solar power in high altitude aircraft appear favorable. The use of microwave power for this purpose is controversial, even though the ground station required would transmit power at levels comparable to existing satellite communications stations. S.L.

N82-29315*# Bell Helicopter Co., Fort Worth, Tex.

INVESTIGATION OF CORRELATION BETWEEN FULL-SCALE AND FIFTH-SCALE WIND TUNNEL TESTS OF A BELL HELICOPTER TEXTRON MODEL 222 Final Report

Patrick K. Squires Jun. 1982 401 p refs
(Contract NAS2-10773)
(NASA-CR-166362; NAS 1.26:166362) Avail: NTIS HC A18/MF A01 CSCL 01C

Reasons for lack of correlation between data from a fifth-scale wind tunnel test of the Bell Helicopter Textron Model 222 and a full-scale test of the model 222 prototype in the NASA Ames 40-by 80-foot tunnel were investigated. This investigation centered around a carefully designed fifth-scale wind tunnel test of an accurately contoured model of the Model 222 prototype mounted on a replica of the full-scale mounting system. The improvement in correlation for drag characteristics in pitch and yaw with the fifth-scale model mounted on the replica system is shown. Interference between the model and mounting system was identified as a significant effect and was concluded to be a primary cause of the lack of correlation in the earlier tests. Author

N82-29316*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.

THE COST OF NOISE REDUCTION FOR DEPARTURE AND ARRIVAL OPERATIONS OF COMMERCIAL TILT ROTOR AIRCRAFT

Henry B. Faulkner and William M. Swan Jun. 1976 118 p refs
(Contract NAS2-7620)
(NASA-CR-137803; NAS 1.26:137803) Avail: NTIS HC A06/MF A01 CSCL 01C

The relationship between direct operating cost (DOC) and noise annoyance due to a departure and an arrival operation was developed for commercial tilt rotor aircraft. This was accomplished by generating a series of tilt rotor aircraft designs to meet various noise goals at minimum DOC. These vehicles ranged across the spectrum of possible noise levels from completely unconstrained to the quietest vehicles that could be designed within the study ground rules. Optimization parameters were varied to find the minimum DOC. This basic variation was then extended to different aircraft sizes and technology time frames. Author

N82-29317*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AUTOMATED OPTIMUM DESIGN OF WING STRUCTURES. DETERMINISTIC AND PROBABILISTIC APPROACHES

S. S. Rao Aug. 1982 47 p refs
(NASA-TM-84475; L-15169; NAS 1.15:84475) Avail: NTIS HC A03/MF A01 CSCL 01C

The automated optimum design of airplane wing structures subjected to multiple behavior constraints is described. The structural mass of the wing is considered the objective function.

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[AIAA PAPER 82-1323] A82-39100

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1981, Conference Papers and Supplementary Papers
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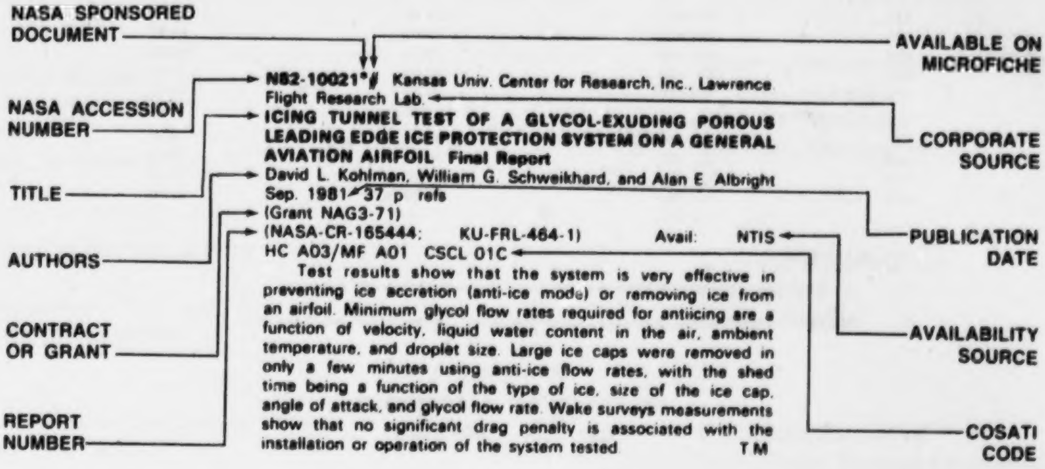
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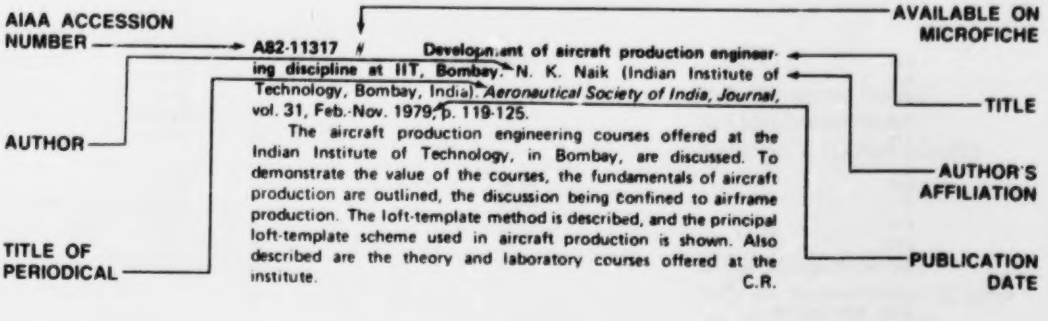
N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS
HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

TYPICAL CITATION AND ABSTRACT FROM *IAA*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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal,* vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING

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IAA ENTRIES

A82-38146 **Efficient optimum design of structures - Program DDDU.** L.-X. Qian, W. Zhong, Y. Sui, and J. Zhang (Dalian Institute of Technology, Dalian, People's Republic of China). *Computer Methods in Applied Mechanics and Engineering*, vol. 30, May 1982, p. 209-224. 12 refs.

An efficient optimization algorithm is developed for engineering structures subject to multiple constraints. This highly non-linear and implicit problem is reduced to a combination of a sequence of quasi-linear constraints and explicit problems of the statically determined structures. The method is based on the Kuhn-Tucker necessary conditions for optimality associated with a simple quadratic program designed simultaneously to determine the Lagrange multipliers and to delete non-active constraints. A number of examples including trusses and wing structures show that the method is efficient when compared with other competing techniques. (Author)

A82-38216 **Forward-swept wings add supersonic zip.** R. DeMeis. *High Technology*, vol. 2, Jan.-Feb. 1982, p. 33-40.

A forward-swept wing aircraft is being built under an Air Force contract for test flying in late 1983. This design has many advantages over conventional aft-swept wing aircraft, including a naturally smoother area distribution, which lowers wave drag and allows a wider fuselage at the center of gravity and, thus, provides greater payload and fuel capacity. However, since twisting of the wings caused by airflow produces extreme shearing forces, the forward-swept wing design has only recently become possible by means of structural tailoring of the wing using graphite-epoxy composite material which compensates for the unstable wing twisting under standard fighter-type flying conditions. In addition, the design confers such a responsive, unstable configuration that computer control is necessary to augment pilot action. Detailed explanations of the main aerodynamic features of the forward-swept wing design are given. N.B.

A82-38222 # **Composite use on helicopters.** J. Ray (United Technologies, Corp., Sikorsky Aircraft Div., Stratford, CT). *Astronautics and Aeronautics*, vol. 20, July-Aug. 1982, p. 60, 61.

Composite material used in components of the Sikorsky S-76 helicopter are reviewed. Composite fiber reinforced with Nomex and an aluminum honeycomb is employed for the horizontal stabilizer. The spar is equipped with caps made of unidirectional graphite-epoxy tape co-cured with Kevlar skin material. Two plies of woven Kevlar cover the caps in order to prevent galvanic corrosion. The inboard section of the spar possesses a precured torque tube of woven Kevlar cloth which is bonded to an aluminum core and provides the dominant load path for torsion and flexural shear. The composite materials are responsible for a 17.4% reduction in the airframe/gross weight ratio and an increase of 20% in the range due to the smooth flush contour of the stabilizer and consequent drag reduction. The fairings and doors of the S-76 are also made of laminated structures, and sandwich panels serve for the windshield support posts, internal frames, longitudinal elements and door jamb. M.S.K.

A82-38223 # **Toward all-composite helicopter fuselage.** L. Marchinski (Boeing Vertol Co., Philadelphia, PA). *Astronautics and Aeronautics*, vol. 20, July-Aug. 1982, p. 61, 62.

The construction and benefits of using all-composite material for helicopter fuselages, particularly on the Boeing Vertol 234, are outlined. The cabin floor of the 234 is made of four composite panels with fiber glass/Kevlar 49 face sheets and a Nomex honeycomb core. Molded-edge rubber seals bonded into the floor assembly durinn co-curing and machined 7050 aluminum fittings at each end of the lateral, Kevlar beams under the lower side of the floor panels have contributed to a vibration rate of less than 0.03 g. A 10% weight saving over that available with an all metal floor has been achieved, as well as greater impact resistance. The success with the floor indicates that replacement of all-metal fuselages with Nomex-honeycomb structures offers a potential weight savings of 33%. Further research is necessary into the effects of lightning strikes and electrical bonding. M.S.K.

A82-38224 # **Committing composites to the Boeing 767.** R. Hammer (Boeing Commercial Airplane Co., Renton, WA). *Astronautics and Aeronautics*, vol. 20, July-Aug. 1982, p. 62.

Applications of Kevlar/graphite composites in the Boeing 767 aircraft are reviewed, noting the higher weight savings which were achieved than were offered by metal or fiber glass/epoxy materials. Results from a NASA/Lockheed program testing the Kevlar composites in comparison with fiber glass parts proved the acceptability of using the Kevlar/graphite for 24 different aircraft components at a weight savings of over 2000 lb. It is concluded that the employment and techniques involving composite technologies are at the same stage as aluminum technology was in the 1930s. M.S.K.

A82-38249 **Mirage 2000 - Towards possible high series production aircraft (Mirage 2000 - Vers l'avion de série).** J. Morisset and N. Beauclair. *Air et Cosmos*, vol. 20, July 10, 1982, p. 26-42. In French.

Design and performance characteristics of the Mirage 2000 aircraft are presented, noting modifications available for different combat missions. The single-engined aircraft is equipped with multiple radar systems, can be used as an interceptor at high or low altitudes, is capable of carrying air-to-ground nuclear tipped missiles, and features two 30 mm cannons. Fly by wire control is standard, and, the aircraft is stable at high angles of attack with a top speed of Mach 2.2 while carrying a full load at 60,000 ft. The internal fuel stores are 3800 liters, and external stores can be added to extend the total range to 1500 km. By wind 1980 the Mirage 2000 had been flight tested in 1677 sorties, with tests being done on five configurations of the aircraft. Details of the design process, the use of composites in the aircraft structure, the operational features of the missile stores, the laser guidance system, and the electronics are provided. M.S.K.

A82-38261 # **Aerodynamic behavior of a slender slot in a wind tunnel wall.** D. B. Bliss (Princeton University, Princeton, NJ). *AIAA Journal*, vol. 20, Sept. 1982, p. 1244-1252. 8 refs. Grant No. AF-AFOSR-77-3337.

A theoretical model for the flow through a single slot of finite length in a wall separating a uniform freestream and a quiescent fluid at different static pressures is constructed. This problem is relevant to understanding the aerodynamic behavior of slots which are used in the test sections of some ventilated wall transonic wind tunnels. The theoretical relationship which is obtained between the pressure differential across the slot and the flow through the slot shows both the linear and quadratic regimes observed in experiments. The linear behavior arises from the acceleration of the cross flow into the slot downstream of the leading edge and from the interaction of streamwise stations along the slot, as well as from the effect of slot taper. Analytical solutions are obtained for two slot planform shapes, and some other cases are solved numerically. The quantitative agreement with experimental data is very encouraging. (Author)

A82-38293 # **Improved solutions to the Falkner-Skan boundary-layer equation.** C. A. Forbrich, Jr. (USAF, Armament Laboratory, Fort Walton Beach, FL). *AIAA Journal*, vol. 20, Sept. 1982, p. 1306, 1307. 11 refs. USAF-supported research.

The results of a state variable approach to computationally solve the Falkner-Skan equation over a wide range of boundary-layer acceleration parameters are presented. The Falkner-Skan equation is concerned with flow past an infinite wedge with a particular vertex angle, and solutions are presented which are accurate to eight places for third order differential equations. Iterative procedures for improving the order of accuracy are described, and an example is provided for the case of an initial wedge angle of 0.40 x pi. The method is considered acceptable for the analysis of slightly accelerating and decelerating flows encountered in low drag and supercritical airfoils. M.S.K.

A82-38405 **VHF radio link for ground-air-ground communications using an integrated voice-data modulation.** G. Benelli (Firenze, Università, Florence, Italy). *Electronics Letters*, vol. 18, June 24, 1982, p. 555, 556. Consiglio Nazionale delle Richerche *Contract No. 81,00,202.*

A possible realization of a data channel between aircraft and ground station is presented, which utilizes a combined amplitude-phase modulation. Amplitude modulation is used to transmit a voice signal, while phase modulation is used for

6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 16.1-16.11. Research supported by the Ministry of Defence (Procurement Executive).

Details of the MACHAN development program for evaluating the unmanned aircraft guidance achievable by a dead reckoning system aided by other systems and sensors are presented. An attitude and heading reference (AHRS) system was concluded to require a vertical reference within 0.5 deg and a heading reference of not more than 4 deg/hr, provide pitch, roll, and yaw rates for the autopilot, operate digitally, possess navigation capability and update, operate within various mission profiles, and be amenable to mass production. The AHRS system constructed featured three single axis gyros, three accelerometers, a dedicated real time microprocessor, and attitude recognition by reference to gravity and initial data. supplementary sensors, such as a single degree of freedom rate integrating gyro and accelerometer, pass data through the microprocessor where magnetic heading and Doppler velocity data are also considered. M.S.K.

A82-39739 # **U.S. Army remotely piloted vehicle supporting technology program.** T. D. Gossett (U.S. Army, Research and Technology Laboratory, Moffett Field, CA). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 18.1-18.10. 10 refs.

Details of the U.S. Army full scale engineering development program for the RPV Aquila are described. The system includes the air vehicle, a recovery system, an air vehicle handler, a remote ground terminal, a ground control station, a launcher subsystem, and a maintenance shelter. With attention focused on the propulsion and antijam data link developments, it is noted that the data link includes a command uplink, telemetry downlink, video downlink, and navigation of the air vehicle relative to the remote ground terminal. Components of the antijam modular integrated communication and navigation system comprise an analog null steerer, modems with chopped chirp waveforms, a direct pseudonoise spread modem, and a phased array. Ducted propellers were determined to offer higher takeoff, and quieter performance and efficiency than open propellers. Finally, operational features of the 20 hp test engines and the FLIR sensor are provided. M.S.K.

A82-39740 # **A terrain following system, an algorithm and a sensor.** E. Skarman (Saab-Scania AB, Linkoping, Sweden) and U. Rehammar (Telefonaktiebolaget L. M. Ericsson, Molndal, Sweden). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 19.1-19.15.

The development of a control logic for terrain following RPVs using radar and laser sensors to detect possible obstacles at least 1300 m in advance is described analytically. Limitations in the theory of linear dynamic systems are discussed in terms of filtering an input command with a low pass filter to avoid exceeding the mechanical environment stress limits of all vehicle subsystems. The odeling of a dynamic system comprises two states of the kinematics, vertical speed and altitude, the two states pitch of the vehicle dynamics, the flight control system, which is an acceleration feedback system, and the low pass filter. The system is shown to have one input and seven functions with simple asymptotes and control is confined to operating at height to height from time to time. Inputs to the command filter are developed along with decision rules, and two- and three-dimensional simulation algorithms are outlined. M.S.K.

A82-39741 # **Sensor stabilisation requirements of RPV's - A simulation study.** K. G. Narayanan, M. Madhuranath, S. K. Bhat, and G. Elangovan (Aeronautical Development Establishment, Bangalore, India). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 21.1-21.8. 6 refs.

The application of pilot simulator video displays to the development of sensors for the stabilization of TV carrying RPVs is described. Either films with servo-induced roll, yaw, and jitter or numerically generated images can be displayed to the RPV TV sensor. Particular attention is given to scaled geometric presentations which produce out-the-window views to pilots. Requirements for the simulation include accurate representations of objects, reflectance/radiance and contrast, RPV sensor accounting for resolution, sensitivity, FOV, look angle, slewing rate, image smear/lag, platform speed, direction, altitude, attitude, and maneuvers. The data link is limited by the range of operation, bandwidth, and noise, and terrains are chosen for the appropriate mission. Block diagrams are provided of the RPV sensor simulator and improvements necessary for the system to be operational. M.S.K.

A82-39742 # **Radars for UMA.** M. Scorer (Marconi Avionics, Ltd., Research Laboratory, Rochester, Kent, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 22.1-22.6.

The implementation of lightweight radar systems in unmanned aircraft (UMA) is discussed. Attention is given to the application of UMA to air defense as a passive receiver system, carrying radiometers as a passive detector, and microwave, millimeter wave, and laser radars for target detection and ranging. The necessity of developing laser radars which operate at eyesafe wavelengths, such as 10 micron CO2 lasers, which are currently too heavy for UMA, is noted. Data gathered by a UMA radar system is gained by means of a transmitter and a receiver, then relayed along a ground link. Millimeter wave radars permit the use of 20 cm antennas on UMAs while maintaining an image resolution of 25 m at 1.5 km, operating at 100 GHz. Flat plate printed circuit antennas several millimeters thick have been fabricated, permitting placement of the receiver on the same substrate as the antenna. Employing magnetrons for high power gain is outlined. M.S.K.

A82-39744 # **Electric propulsion for a mini RPV system.** G. R. Seemann and G. L. Harris (Developmental Sciences, Inc., City of Industry, CA). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 12.1-12.6. Contract No. F33657-79-C-0508.

The advantages of electric propulsion, such as reliable instant-start, enhanced survivability, possible higher performance and improved storability, have merited further investigation. Advances in the development of the lithium battery have increased the payload performance to 200-300 Wh/lb with the battery being the prime factor of the propulsion system concept. A point design system of the mini-RPV is described based on predictions after a strawman mission, and studies of current and advanced concepts of an electric propulsion system are discussed in terms of the components of the system. Temperature control is studied, and performance estimates of the mini-RPV are outlined such as a speed range of 60-150 kts, a climb rate of 600 ft/min and an endurance of five hours. The system's potential use as an expendable vehicle to conduct surveillance, jamming or kamikaze missions is foreseen. R.K.R.

A82-39745 # **Flight control systems for aerial targets.** A. W. Bargery and K. W. Rosenberg (Marconi Avionics, Ltd., Rochester, England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 17.1-17.18. Research supported by the Ministry of Defence (Procurement Executive).

Aerial targets, a class of unmanned aircraft (UMA), present constraints different from other classes of UMA. The control system design is partially determined by data link, tracking facilities, and range location. The flight control systems of two targets, the Jindivik, in operation for 25 years, and the Sea Vixen, soon to be in operation, are described. The Advanced Subsonic Aerial Target (ASAT) flight control system is under development, and its design approach, which anticipates a more expendable target vehicle, is described. The ground station for the ASAT requires a high initial investment, but the air vehicle requires a minimal cost. A comparison of each of these three systems is presented. The Jindivik has high operating skills, the Sea Vixen has medium skills, and the ASAT has low skills, while the Jindivik and the Sea Vixen require large crews and the ASAT requires a small crew. Block diagrams of each UMA are included. R.K.R.

A82-39746 **The design of a viewing system for near real time stereo images from a UMA borne linescan sensor.** J. A. C. Beattie (Royal Aircraft Establishment, Farnborough, Hants., England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 20.1-20.3.

Laboratory trials demonstrate a display of stereoscopic images, received in data streams with a bandwidth of 512 kHz (-3 dB). The sensing and presentation of the data are described. An optical system consisting of a German television lens of 10.2 mm focal length and an F number of 1.8 is used. The image plane is divided in two by a right angle splitting prism with each half falling on a separate linear array angled 7.5 degrees from the optical axis. The two linear arrays provide data alternately, which is converted to form a pair of visible images. The demultiplexing system is explained, as well as various methods of storing the data. The effect of caroboarding is less severe with this system as it has an effective back drop. The viewing system is described with its main problem being that a 90 degree twist in the image path is necessary for correct viewing. The proposed air vehicle BAe (Filton) Stabileye MkII is discussed. In addition, it is shown that excessive movement may cause severe blurring, leading to difficulties in the fusion of the stereo pairs. Fifty lines of horizontal disparity and 12 lines of vertical disparity can be tolerated with a good stereo viewing facility. Two 4-bit images have been successfully stored and extracted using look up table methods. R.K.R.

A82-39747 # **Opto-electronical push-broom scanners for navigation, reconnaissance and generation of digital data bases.** O. Hofmann and P. M. W. Navé (Messerschmitt-Bolkow-Blohm GmbH, Munich, West Germany). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 20A.1-20A.3.

A82-39750 # The design of a RPV ground station simulator. J. Ford and P. G. Thomasson (Cranfield Institute of Technology, Cranfield, Beds., England). In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Supplementary Papers. (A82-39727 19-01) Bristol, England, University of Bristol, 1982, p. 26.1-26.7. Research supported by the Ministry of Defence (Procurement Executive).

A simulator complex has been designed representing the ground station environment of a remotely piloted vehicle (RPV) system, in order to evaluate the human factors of a ground control station such as the work load of the crew. The design requirements of the simulator are described, and the reasons for using a multicomputer design are explained. The primary requirement of the simulator is that it operate in real time, and a second requirement is that it be flexible in order to accommodate specification changes in the system. An example of the flexibility of the system is that the memory requirement of the system has increased from 24 K bytes to 128 K bytes with no need to modify the framework or computing capacity. The goals in creating a ground control station are that it be able to preplan missions for the RPV, to control and replan missions while the RPV is airborne, and to interpret real time imagery. Various diagrams are included. R.K.R.

A82-39836 # Aerodynamic aspects of aircraft dynamics at high angles of attack /AGARD Lecture/. K. J. Orlik-Ruckemann (National Aeronautical Establishment, Ottawa, Canada). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1363.* 22 p. 37 refs.

This paper presents a review of some of the fluid dynamics phenomena that are associated with the oscillatory flight at high angles of attack, with particular emphasis on asymmetric shedding of forebody vortices, asymmetric breakdown of leading edge vortices, the oscillatory motion of such vortices, and the time lag between the motion of the vortices and that of the aircraft. These phenomena cause a number of important effects on the dynamic stability parameters at high angles of attack (high alpha), such as strong nonlinearities with alpha, significant static and dynamic aerodynamic cross-coupling, large time-dependent and hysteresis effects, and a strong configuration dependence. The need to consider all the aerodynamic reactions in their vectorial form is emphasized, and the importance of the abovementioned effects on our prediction capabilities of aircraft behavior at high alpha is discussed. Development of adequate mathematical models is advocated and requirements for advanced wind tunnel techniques for performing the necessary oscillatory experiments are described. The oral presentation is illustrated by movie films showing flow visualization on oscillating models. (Author)

A82-39852 On the state of technology and trends in composite materials in the United States. J. R. Vinson (Delaware, University, Newark, DE). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 353-361. 16 refs.

In connection with the ongoing NASA Aircraft Energy Efficiency Composite Primary Aircraft Program a number of composite material structural components have been installed on commercial aircraft and are in service today. The composite components involved include rudder, vertical fin, ailerons, elevators, and horizontal tail. Attention is given to the use of graphite composites in commercial and military aircraft, F100 afterburner nozzle flaps made of carbon-polyimide composite, the graphite-epoxy airframe of the Learfan 2100, the use of Kevlar in helicopters, the employment of Kevlar composites in sailplanes, the fabrication of the fifty foot long booms of the Space Shuttle from graphite epoxy, and the use of Kevlar-epoxy in the design of many rocket motor cases. Unfortunately, cost and confidence are still major obstacles toward more use of composites in the auto industry. G.R.

A82-39860 Tests of CFRP spar/rib models with corrugated web. Y. Tada, T. Ishikawa, and E. Nakai (National Aerospace Laboratory, Chofu, Tokyo, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 461-470. 5 refs.

Static strength tests are conducted on cantilever beams with corrugated web, models of spars and ribs used in aircraft structures, which are fabricated from carbon fiber reinforced plastics. The shear strength of the corrugated web, the strain distributions, and the failure modes are evaluated for three types of models having different corrugation depths and laminate constructions. Results show that the ultimate strengths of the webs are approximately equivalent to the shear strength of flat specimens of the same laminate construction. In addition, the depth of the corrugation does not crucially change the strain distribution and the static bending strengths, but does effect the failure mode. Strengthened layers of the flange-web connections have little effect on the web strength. The critical state of the webs can be identified by observing the magnitude of the surface strains, not by the displacements. N.B.

A82-39862 Evaluation of CFRP prototype structures for aircraft. Y. Noritake, T. Kohda, Y. Abe, F. Yamauchi, S. Toyohira, K. Mogami, H. Arai, and N. Arata (Japan Defense Agency, Technical Research and Development Institute, Tachikawa, Tokyo, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 478-486.

The results of flight test programs to test the suitability of CFRP advanced composites for aircraft structures are presented. The CFRP components tested included a rudder and rear nose landing gear door of a supersonic trainer, ground spoilers of a C-1 transport, and the outer leading edge slat rails of an antisubmarine patrol seaboat. Proof load tests were performed on the ground to affirm that the CFRP parts were as strong as conventional materials. The flight tests covered stresses from velocity, altitude, angle of attack, and load factor of the aircraft and stress on the composite components. Two and one-half years of flight data, with inspections every 200 hours and 9 months, were combined with coin tapping tests for external structural elements. No rigidity degradations were observed on the spoilers or the slat rails and all test components were evaluated as remaining in satisfactory condition. M.S.K.

A82-39863 Developments on graphite/epoxy T-2 nose landing gear door. K. Mogami, F. Yamauchi (Japan Defense Agency, Technical Research and Development Institute, Tachikawa, Tokyo, Japan), Y. Sakatani, and Y. Yamaguchi (Mitsubishi Heavy Industries, Ltd., Nagoya Aircraft Works, Nagoya, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 487-493.

Attention is given to the material systems and processing specially developed for the graphite/epoxy composite door, among them unidirectional tapes, fabrics, chopped fiber materials, and semi-cocuring techniques. To evaluate the durability of the graphite/epoxy skin laminates, water absorption tests and fatigue tests are performed at low, high, and room temperatures for the design required. The all-graphite/epoxy beam-fittings were fabricated using the hot-pressing technique and tested to verify the bearing and bending strength according to design requirements. The saving in weight came to 25%. C.R.

A82-39864 Design, fabrication and qualification of the T-2 composite rudder. F. Yamauchi, K. Mogami (Japan Defense Agency, Technical Research and Development Institute, Tachikawa, Tokyo, Japan), T. Fukui, and T. Sato (Fuji Heavy Industries, Ltd., Aircraft Engineering Div., Utsunomiya, Tochigi, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 494-503.

It is pointed out that this is the first primary control surface to be flight tested in Japan. The rudder has a span of 1.53 m, a 0.71-m chord at the midspan, and an area of 1.05 sq m. The design involves a single-spar, full depth honeycomb sandwich structure. Graphite/epoxy is used for the skins, spar, upper and lower closure ribs, and leading edge ribs. The graphite/epoxy parts make up approximately 40% of the total weight. The spar and closure ribs are precured and bonded to the sandwich assembly after the skins are cured. Nine precured leading edge ribs are attached with cherry-lock fasteners in addition to normal adhesive bonding. It is noted that a conservative design approach was used and that the primary objectives were to obtain actual production experience and in-service operational experience for a composite primary control surface. C.R.

A82-39865 Development of the advanced composite ground spoiler for C-1 medium transport aircraft. F. Yamauchi, K. Mogami (Japan Defence Agency, Technical Research and Development Institute, Tachikawa, Tokyo, Japan), H. Masaeda, and T. Shirata (Kawasaki Heavy Industries, Ltd., Aircraft Div., Kagamihara, Gifu, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 504-512.

The research and development program for the graphite/epoxy ground spoiler for the C-1 medium transport aircraft is discussed. The design requirement was that the spoiler provide strength and rigidity not less than the baseline spoiler in addition to interchangeability. The design analysis was done by finite element method and the detail design configurations of major structural components were evaluated by trade-off tests in the initial design phase, showing that the components met design requirements. Successful environmental characteristic tests were also conducted. The scattering characteristic of the Gr/E for static and fatigue strength were obtained and found to be significantly superior to that of aluminum alloy. Full scale verification tests were also passed. C.D.

A82-39866 Fabrication of CFRP prototype structure for aircraft horizontal tail leading edge slat rail. F. Yamauchi, K. Mogami (Japan Defense Agency, Technical Research and Development Institute, Tochikawa, Tokyo, Japan), K. Suzuki, T. Kiho, and T. Ikuyama (Shin Meiwa Industry Co., Ltd., Kobe, sion for a heavy and inertial body. The solutions are compared both with bird flight and mechanical flight. C.D.

A82-40915 * # Advanced technologies applied to reduce the operating costs of small commuter transport aircraft. O. Masefield, A. Turi, and M. Reinicke (Pilatus Aircraft, Ltd., Stans, Switzerland). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 352-358. NASA-supported research.

The application of new aerodynamic, structural, and propulsion technologies to a specified baseline commuter aircraft is studied. The assessment models can be used on a desktop calculator and include a sizing program, operating cost program, and passenger ride qualities model. Evaluation is done with a step-by-step approach and is applied to range, number and type of engines, structure, wing selection, and configuration. A 40 percent direct operating cost saving is anticipated compared to current well established commuter aircraft. C.D.

A82-40917 # Design and experimental verification of the USB-flap structucture for NAL STOL aircraft. M. Sano (National Aerospace Laboratory, Tokyo, Japan), Y. Fujimori (National Space Development Agency, Tokyo, Japan), and S. Maekawa (Kawasaki, Heavy Industries, Ltd., Gifu, Japan). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 370-375. 6 refs.

In order to verify the safety of the USB flap structure of the NAL STOL experimental aircraft, tests were carried out on structural models, including a test to detect thermal buckling temperature, vibration tests, and an acoustic fatigue test at elevated and room temperature. The USB flap structure, the acoustic fatigue design, the structure and static and dynamic characteristics of the test panel are discussed, including the resonant frequency, mode shape and damping coefficient, static thermal response, and dynamic response. It was found that thermal buckling occurred on test panels, that resonant frequencies of the flat test panels fall in the range between those of clamped and those of simply supported plates, and that through the prescribed fatigue test period, all structural models proved themselves to be strong enough to resist both acoustic and thermal loading. C.D.

A82-40921 * # A summary of V/STOL inlet analysis methods. D. P. Hwang and J. M. Abbott (NASA, Lewis Research Center, Cleveland, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 402-409. 24 refs.

The methods used to analyze the aerodynamic performance of V/STOL inlets at the NASA Lewis Research Center are briefly described. Recent extensions and applications of the method are emphasized. They include the specification of the Kutta condition for a slotted inlet, the calculation of suction and tangential blowing for boundary layer control, and the analysis of auxiliary inlet geometries. A comparison is made with experiment for the slotted inlet and also for tangential blowing. Finally, an optimum inlet diffuser velocity distribution is developed. (Author)

A82-40925 * # A unique flight test facility - Description and results. R. R. Meyer, Jr. (NASA, Flight Research Center, Edwards, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 433-448. 13 refs.

The Dryden Flight Research Facility has developed a unique research facility for conducting aerodynamic and fluid mechanics experiments in flight. A low aspect ratio fin, referred to as the flight test fixture (FTF), is mounted on the underside of the fuselage of an F-104G aircraft. The F-104/FTF facility is described, and the capabilities are discussed. The capabilities include (1) a large Mach number envelope (0.4 to 2.0), including the region through Mach 1.0; (2) the potential ability to test articles larger than those that can be tested in wind tunnels; (3) the large chord Reynolds number envelope (greater than 40 million); and (4) the ability to define small increments in friction drag between two test surfaces. Data are presented from experiments that demonstrate some of the capabilities of the FTF, including the shuttle thermal protection system airload tests, instrument development, and base drag studies. Proposed skin friction experiments and instrument evaluation studies are also discussed. (Author)

A82-40928 * # Determination of airplane aerodynamic parameters from flight data at high angles of attack. V. Klein (Joint Institute for Advancement of Flight Sciences, Hampton, VA) and J. G. Batterson (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 467-474. 5 refs.

The problem of determining airplane aerodynamic model equations and estimating the associated parameters from flight data taken at high angles of attack is addressed. Two representations of the aerodynamic function based on the polynomial and spline representations are given. Then the technique of building an adequate model using a stepwise regression is presented with examples demonstrating the construction of the model and various approaches to model verification. (Author)

A82-40930 * # Computational and experimental studies of light twin aerodynamic interference. W. G. Thomson, W. H. Wentz, Jr., and C. Ostowari (Wichita State University, Wichita, KS). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 489-495. Research supported by the Beech Aircraft Co. and NASA.

The results of an analytical and experimental study of aerodynamic interference effects for a light twin aircraft are presented. Both the influence of a body (either fuselage or nacelle) on a wing and the influence of a wing on a body are studied. The wing studied uses a new natural laminar flow airfoil with variable camber movable trailing edge. A three-dimensional panel method program utilizing surface source and surface doublet singularities was used to design wing-nacelle and wing-fuselage fairings. Experiments were conducted using a 1/6 scale reflection plane model. Forces, pressures, and surface flow visualization results are presented. Results indicate that potential flow analysis is useful to guide the design of intersection fairings, but experimental tuning is still required. While the study specifically addressed a light twin aircraft, the methods are applicable to a wide variety of aircraft. (Author)

A82-40931 * # Dual wing, swept forward swept rearward wing, and single wing design optimization for high performance business airplanes. M. D. Rhodes and B. P. Selberg (Missouri-Rolla, University, Rolla, MO). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 496-511. 32 refs. Grant No. NAG1-26.

An investigation was performed to compare closely coupled dual wing and swept forward swept rearward wing aircraft to corresponding single wing 'baseline' designs to judge the advantages offered by aircraft designed with multiple wing systems. The optimum multiple wing geometry used on the multiple wing designs was determined in an analytic study which investigated the two- and three-dimensional aerodynamic behavior of a wide range of multiple wing configurations in order to find the wing geometry that created the minimum cruise drag. This analysis used a multi-element inviscid vortex panel program coupled to a momentum integral boundary layer analysis program to account for the aerodynamic coupling between the wings and to provide the two-dimensional aerodynamic data, which was then used as input for a three-dimensional vortex lattice program, which calculated the three-dimensional aerodynamic data. The low drag of the multiple wing configurations is due to a combination of two dimensional drag reductions, tailoring the three dimensional drag for the swept forward swept rearward design, and the structural advantages of the two wings that because of the structural connections permitted higher aspect ratios. (Author)

A82-40932 * # Assessment of advanced technologies for high performance single-engine business airplanes. D. L. Kohlman (Kohlman Aviation Corp., Lawrence, KS) and B. J. Holmes (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 512-563. 24 refs.

The prospects for significantly increasing the fuel efficiency and mission capability of single engine business aircraft through the incorporation of advanced propulsion, aerodynamics and materials technologies are explored. It is found that turbine engines cannot match the fuel economy of the heavier rotary, diesel and advanced spark reciprocating engines. The rotary engine yields the lightest and smallest aircraft for a given mission requirement, and also offers greater simplicity and a multifuel capability. Great promise is also seen in the use of composite material primary structures in conjunction with laminar flow wing surfaces, a pusher propeller and conventional wing-tail configuration. This study was conducted with the General Aviation Synthesis Program, which can furnish the most accurate mission performance calculations yet obtained. O.C.

A82-40933 * # The design integration of wingtip devices for light general aviation aircraft. R. V. Gifford (NASA, Langley Research Center, Hampton, VA) and C. P. van Dam (Kansas, University, Lawrence, KS). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings.

Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 564-569. 21 refs.

An investigation was conducted to determine the load carrying capabilities and structural design requirements for wingtip devices on general aviation aircraft. Winglets were designed and analyzed as part of a research program involving a typical agricultural aircraft. This effort involved analytical load prediction for the winglets, structural design for both the winglets and aircraft installation, structural load testing and flight test verification. Conclusions from this program are believed to be applicable to the use of wingtip devices on light-weight general aviation aircraft. (Author)

A82-40934 # **Operation V10F - Development of a composite material wing.** G. Hellard (Société Nationale Industrielle Aérospatiale, Toulouse, France) and D. Chaumette (Avions Marcel Dassault - Breguet Aviation, Vaucresson, Hauts-de-Seine, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 570-578.

The design development and detailed structural and fabrication method features of the Falcon 10 business jet aircraft carbon fiber reinforced plastic composite wing are described, with emphasis on the design and testing of individual wing structure components such as stiffened ribs and integrally stiffened upper and lower surface panels. The testing of laminate composite wing structure element properties included transverse loading, thermal and mechanical fatigue, shear, combined shear and bending, fuel pressure, tension, and compression. The delamination and lightning strike behavior of the wing components were also assessed. Finally, all structural elements were assembled and tested for static loads and fatigue. The composite wing represents a 20.3 percent weight saving over the metallic wing it replaces. O.C.

A82-40935 # **A one-shot autoclave manufacturing process for carbon epoxy components.** M. Kaltatzidis, R. Renz (Dornier GmbH, Friedrichshafen, West Germany), and D. Wurzel (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Stuttgart, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 579-585.

For the Alpha-Jet aircraft Dornier has developed and fabricated a carbon-/epoxy horizontal stabilizer, which has already successfully completed its qualification tests. This paper presents the requirements and goals of this development and describes the structural design of the horizontal stabilizer. For its leading and trailing edges a new one-shot manufacturing technique has been developed. The toolings are described, weight and cost savings are reported. This technique is now being applied for series production of ailerons for the Do 228 Commuter Aircraft. A brief presentation of the results of the qualification tests under various environmental conditions (humidity and temperature) is given. (Author)

A82-40936 # **Non-honeycomb F-16 horizontal stabilizer structural design.** D. N. Butcher (General Dynamics Corp., Fort Worth, TX). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 586-592.

A description is given of the F-16 fighter's horizontal stabilizer structural design and fabrication methods. The primary components of the stabilizer are graphite/epoxy composite skins, which are mechanically fastened with countersunk rivets to a one-piece sheet aluminum corrugated substructure and a machined aluminum pivot fitting. The skins and substructure are tooled to a common inside mold-line surface to facilitate assembly. Weight, construction and maintenance costs comparisons are made with the full depth-bonded honeycomb stabilizer design which the present one will replace. Despite a weight of 165.9 lb, by comparison to 157.8, the new stabilizer represents a 50% fabrication cost reduction at the 600th stabilizer produced. Lower maintenance costs are expected, in view of the long-term service problems associated with the honeycomb fabrication alternative. O.C.

A82-40937 # **Material identification for the design of composite rotary wings.** V. Giavotto, C. Caprile, M. De Capitani, L. Salvioni (Milano, Politecnico, Milan, Italy), V. Caramaschi, G. C. Maffioli, and F. Musai (Costruzioni Aeronautiche Giovanni Agusta S.p.A., Gallarate, Italy). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 593-606. 15 refs.

Among the developments that appear to be absolutely needed for the design of advanced composite rotary wings there are material models, to be supported by substantial experimentation and to be capable of an accurate modeling of the behavior of multilayer FRPs, complete of failure criteria regarding all possible failure modes. This paper reports an experimental activity carried on by Aerospace Department of Politecnico of Milano in cooperation with Costruzioni Aeronautiche G. Augusta. The most relevant part of such activity has been a fairly large campaign on tubular specimens in biaxial stress states and plane specimens in uniaxial stress states. All tests have been run statically, measuring stresses and strains up to failure. The results of such measurements have been so far worked out to verify existing material models and failure criteria. No one existing failure criteria seems to be completely adequate to the whole stress domain explored. (Author)

A82-40939 # **Dynamic energy transfer between wind and aircraft.** G. Schänzer (Braunschweig, Technische Universität, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-4087C 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 615-621. 6 refs.

The energy effect of vertical wind on glider aircraft is studied. The theoretical basis of maximum dynamic energy transfer is discussed, and the energy transfer problem is investigated using a glider with up and downdrafts varying in space. The response of the aircraft is calculated with a nonlinear simulation program on a digital computer. Maneuvering that produces optimal energy transfer is connected with a high kinetic energy level of the aircraft and high load factors which depend on vertical wind velocities. Energy-optimal flight maneuvers significantly increase the average groundspeed of a glider aircraft compared to the procedure described by Nickel and McCready (1949). C.D.

A82-40940 # **Digital computer simulation of modern aeronautical digital communication systems.** S. Chow (Nanjing Aeronautical Institute, Nanjing, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 622-629. 11 refs.

A Monte Carlo simulation method for modern aeronautical digital communication systems is described. Its relationship to various parameters is studied, including filtering, limiting, carrier frequency offset, bit time jitter, and multipath effects in A/G and A/A communications. (Author)

A82-40941 # **Flight simulation studies on the feasibility of laterally segmented approaches in an MLS environment.** L. J. J. Erkelens (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 630-641. 5 refs.

On the moving base flight simulator of the NLR an investigation was carried out to establish a number of minimum approach parameters concerning laterally segmented approach paths, assuming that guidance was provided by an MLS facility. Seven laterally segmented approach paths with different turn angles and final intercept altitudes were flown manually with a simulated heavy transport aircraft in the final approach configuration. Results were obtained in terms of tracking accuracy, pilot effort ratings and pilot responses to a questionnaire. A subsequent simulation program was carried out recently, in which as new items were introduced: a more realistic simulation of the MLS environment (MLS coverage area and signal noise), implementation of aircraft configuration changes (flaps, landing gear). A third simulation program is prepared in which the interaction is emphasized between the air traffic controller and the flight crew. The pilot is vectored to a point within MLS coverage, from which he is expected to intercept a laterally segmented approach path using MLS-guided intercept procedures. (Author)

A82-40942 # **A concept for 4D-guidance of transport aircraft in the TMA.** V. Adam and W. Lechner (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 642-653. 18 refs.

The four dimensional (4D) guidance of aircraft in the TMA allows for precise control of the minimum separation and thus efficient use of the available approach capacity of the airport. A concept for the 4D-guidance of transport aircraft has been developed and a corresponding control mode has been integrated in an automatic flight control system for transport aircraft. The 4D mode is based on the usual radar vector guidance technique of air traffic control and, therefore, is characterized by a succession of flight sections with constant values for indicated airspeed, heading and descent rate. The time of arrival is controlled by altering the path via a delay fan. The algorithm for the calculation of the commanded 4D flight path takes into account suitable wind models updated by actual wind data. In the paper the 4D mode is described and first flight test results are discussed. (Author) is examined. A semispan model, typical of a transport aircraft with a supercritical wing was tested. A 3/4 fan cowl high bypass engine was located at six positions underneath the wing. Measurements included pressure and balance force. It is shown that while accurate simulation of engine nozzle geometry is of prime importance, tests on free flow nacelles are useful for selecting engine position. Interference forces derived from pressure integration are only useful for determining trends in interference effects for flexible initial tests. Author (ESA)

N82-28263# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.
A FINITE DIFFERENCE METHOD FOR THE CALCULATION OF TRANSONIC FLOW ABOUT A WING, BASED ON SMALL PERTURBATION THEORY
J. vanderVooren, G. H. Huizing, and A. vanEssen 5 Mar. 1981 103 p refs
(Contract NIVR-1739)
(NLR-TR-81031-U) Avail: NTIS HC A06/MF A01

A calculation method for the transonic flow about a semiwing based on transonic small perturbation theory, is presented. The influence of a body can be simulated by prescribing appropriate transverse velocities in a vertical plane through the wing root. The wing should be thin and have little dihedral, camber, and twist and a not too blunt leading edge. The body should be slender. The angle of incidence must be small. However, highly swept wings are allowed. A fully finite difference scheme is implemented for a correct shock capture. Line relaxation is used to solve the corresponding nonlinear equations. It is indicated that too much artificial viscosity leads to an unrepresentative calculation, and too little can lead to instabilities. Author (ESA)

N82-28264# General Accounting Office, Washington, D. C. Accounting and Financial Management Div.
COMPUTER OUTAGES AT AIR TERMINAL FACILITIES AND THEIR CORRELATION TO NEAR MISS MID-AIR COLLISIONS (AFMD-82-43)
16 Feb. 1982 17 p refs
(B-206064) HC A02/MF A01

The frequency of computer failures at terminal facilities and the extent of correlation between these failures and near mid-at collisions were investigated in a survey of nine terminal facilities. No direct correlation between the computer outages and reported mid-air collisions or the safety related incidents was found. R.J.F.

N82-28265# Aeronautical Research Labs., Melbourne (Australia).
A STUDY OF WIND SHEAR EFFECTS ON AIRCRAFT OPERATIONS AND SAFETY IN AUSTRALIA
K. W. Anderson and B. A. J. Clark Mar. 1981 84 p refs
(ARL-Sys-Rept-24; AR-002-271) Avail: NTIS HC A05/MF A01

The ergonomics aspects of aircraft operation in conditions of local variations of wind were studied. Questionnaires were analyzed for subject understanding, detection of wind difficulties, frequency of wind shear and downdraft situations, pilot techniques, and forewarning methods. Pilots often found terrain-induced downdrafts and thunderstorm wind shears troublesome. Operations in irregular terrain away from major aerodromes were frequently cited for wind shear hazards. Pilot judgements on the most susceptible aircraft types were not readily explicable in terms of size, landing speed or wing loading. Pilots and ATCs indicated that currently used cues in wind shear conditions include visual estimates of glideslope departures, precision approach radar observations and aircraft-based measurements of wind or ground speed. Ground-based remote sensing equipment for detecting stable wind shear is considered. A synopsis of wind-involved airliner crashes and a summary of meteorological conditions for the occurrence of local wind variations are included. Author

N82-28266*# Villanova Univ., Pa.
GUST RESPONSE OF COMMERCIAL JET AIRCRAFT INCLUDING EFFECTS OF AUTOPILOT OPERATION Final Report
Joseph H. Goldberg Jun. 1982 125 p refs
(Contract NAS1-16095)
(NASA-CR-165919) Avail: NTIS HC A06/MF A01 CSCL 01C

A simplified theory of aircraft vertical acceleration gust response based on a model including pitch, vertical displacement and control motions due to autopilot operation is presented. High-order autopilot transfer functions are utilized for improved accuracy in the determination of the overall response characteristics. Four representative commercial jet aircraft were studied over a wide range of operating conditions and comparisons of individual responses are given. It is shown that autopilot operation relative to the controls fixed case causes response attenuation of from 10 percent to approximately 25 percent depending on flight condition and increases in crossing number up to 30 percent, with variations between aircraft of from 5 percent to 10 percent, in general, reflecting the differences in autopilot design. A detailed computer program description and listing of the calculation procedure suitable for the general application of the theory to any airplane autopilot combination is also included. Author

N82-28267# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio. Biomechanical Protection Branch.
COMPARATIVE VERTICAL IMPACT TESTING OF THE F/FB-111 CREW RESTRAINT SYSTEM AND A PROPOSED MODIFICATION
Bernard F. Hearon, James W. Brinkley, James H. Raddin, Jr., Lawrence A. McGowan, and Joseph M. Powers Mar. 1982 312 p refs
(AF Proj. 7231)
(AD-A113957; AFAMRL-TR-82-13) Avail: NTIS HC A13/MF A01 CSCL 01/3

An impact test program was conducted to evaluate the operational F/FB-111 crew seat and restraint system and a proposed modification. A primary objective of the program was to compare human response to vertical impacts in the two restraint harnessess. A total of 67 human impact tests were performed on the Vertical Deceleration Tower up to 10 G peak, 26 ft/sec. Subjects were exposed to comparable impacts at different seat elevations in both harnesses to allow parametric analysis of the test results. Measured data included seat acceleration and velocity, head and chest translational acceleration components, triaxial forces acting on the seat and footrest, forces acting at the restraint harness, attachment, and deplacements of various body segments. The resultant head and chest accelerations were significantly greater in the modified harness than in the operational harness, regardless of seat elevation. On the basis of this comparison, the proposed modification to the F/FB-111 crew seat and restraint is not recommended for implementation. Future restraint harness modification proposals should be based on careful evaluation of all unconventional design features of the operational harness and should address all mechanisms by which adverse loads may be imposed on the seat occupant. In addition, future redesign efforts of the F/FB-111 escape system should provide improved landing impact attenuation. GRA

N82-28268# Air Force Engineering and Services Center, Tyndall AFB, Fla. Engineering and Services Lab.
SMOKE ABATEMENT SYSTEM FOR CRASH RESCUE/FIRE TRAINING FACILITIES Final Report, Sep. 1979 - Sep. 1981
Anthony J. Kwan and John A. Hamre Sep. 1981 33 p
(AF Proj. 2505)
(AD-A114380; AFESC/ESL-TR-81-43) Avail: NTIS HC A03/MF A01 CSCL 13/2

This report provides the design for a smoke-abated aircraft crash/rescue trainer. The design is for a 75-ft diameter fire area suitable for operation in freezing and nonfreezing climates. With this system liquid petroleum fuels can be burned with little or no smoke by injecting a fine water spray near the surface of the burning fuel. This method of smoke abatement is being applied at military fire fighting training facilities. The report includes all equipment necessary for the smoke abatement function and provides detailed step-by-step operating procedures. Author (GRA)

N82-28269*# Analytical Mechanics Associates, Inc., Hampton, Va.
TERMINAL AREA AUTOMATIC NAVIGATION, GUIDANCE, AND CONTROL RESEARCH USING THE MICROWAVE LANDING SYSTEM (MLS). PART 4: TRANSITION PATH RECONSTRUCTION ALONG A STRAIGHT LINE PATH CONTAINING A GLIDESLOPE CHANGE WAYPOINT Final Report
Samuel Pines Washington NASA Jun. 1982 40 p refs
(Contract NAS1-15116)

(NASA-CR-3574-Pt-4; NAS 1.26:3574; AMA-81-37) Avail: NTIS HC A03/MF A01 CSCL 17G

The necessary algorithms to reconstruct the glideslope change waypoint along a straight line in the event the aircraft encounters a valid MLS update and transition in the terminal approach area are presented. Results of a simulation of the Langley B737 aircraft utilizing these algorithms are presented. The method is shown to reconstruct the necessary flight path during MLS transition resulting in zero cross track error, zero track angle error, and zero altitude error, thus requiring minimal aircraft response. T.M.

N82-28270# Radio Technical Commission for Aeronautics, Washington, D. C.

MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR AUTOMATIC DIRECTION FINDING (ADF) EQUIPMENT

13 May 1982 53 p Supersedes RTCA/DO-137
(RTCA/DO-179; RTCA/DO-137) Avail: NTIS HC A04/MF A01

Minimum operational performance standards are set forth for automatic direction finding equipment. Incorporated in these standards are system characteristics that will benefit users of the system as well as designers, manufacturers, and installers. Compliance with these standards is recommended as a means of assuring that the equipment will satisfactorily perform its intended function under all conditions normally encountered. L.F.M.

N82-28274# Arinc Research Corp., Annapolis, Md.

COST ANALYSIS OF THE DISCRETE ADDRESS BEACON SYSTEM FOR THE LOW-PERFORMANCE GENERAL AVIATION AIRCRAFT COMMUNITY Final Report

S. Kowalski, K. Peter, A. Schust, D. Swann, and P. Young Sep. 1981 364 p
(Contract DOT-FA76WA-3788)
(AD-A112957; Rept-1326-01-15-2529; FAA-RD-81-61) Avail: NTIS HC A16/MF A01 CSCL 17/7

This report presents the results of cost analysis of various Discrete Address Beacon System (DABS) configurations that may be implemented for the low-performance general aviation aircraft community. The DABS designs considered in this analysis were developed by ARINC Research Corporation using state-of-the-art technology. GRA

N82-28276# National Aerospace Lab., Amsterdam (Netherlands). Informatics Div.

IMPROVED 243 MHz HOMING ANTENNA SYSTEM FOR USE ON HELICOPTERS

F. Klinker 23 Apr. 1981 24 p refs Presented at Intern. IEEE/AP-s Symp., Los Angeles, 16-19 Jun. 1981
(NLR-MP-81022-U) Avail: NTIS HC A02/MF A01

The principles of azimuthal homing systems used in SAR search and rescue helicopters are outlined. In current SAR systems the homing signal is represented by the intersection of the radiation from two vertical dipoles. Intersections at 0 and 180 deg with respect to a center line are desired, but those at 120, 140, and 200 deg must be eliminated. Pattern distortion, which results in spurious intersections, is caused by mutual coupling between antennas, electromagnetic interaction coupling through the beam forming network, and attenuation and reflection of the received signal by the helicopter fuselage. The design uses reflectors on the antennas to reduce fuselage influence, and increases separation between radiation patterns to prevent intersections arising from mutual coupling. No homing ambiguities are reported in flight tests of a helicopter using the redesigned system. Author (ESA)

N82-28277# National Transportation Safety Board, Washington, D. C. Bureau of Accident Investigation.

SPECIAL INVESTIGATION REPORT: AIR TRAFFIC CONTROL SYSTEM

8 Dec. 1981 60 p
(PB82-136276; NTSB-SIR-81-7) Avail: NTIS HC A04/MF A01 CSCL 05A

The air traffic control system was investigated following a strike of the air traffic controllers which resulted in the walkout of about 11,400 of the 17,275 controller workforce. The investigation included an analysis of ATC data, the ability of the FAA to meet staffing requirements, the qualifications of the controller workforce, training for new controllers, the effect of stress and fatigue, facility supervision and management, the control of the capacity of the system, and computer and equipment reliability. No basic ATC procedures were changed or compromised in order to keep the ATC system in operation, and the high level of ATC safety required is possible within the present system. GRA

N82-28278*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FLIGHT EVALUATION OF LORAN-C IN THE STATE OF VERMONT Final Report, Jul. 1979 - May 1981

F. D. Mackenzie (Transportation Systems Center, Cambridge, Mass.) and C. D. Lytle Sep. 1981 162 p refs
(NASA-TM-84711; NAS 1.15:84711; PB82-138603; DOT-TSC-RSPA-81-10) Avail: NTIS HC A08/MF A01 CSCL 17G

A flight evaluation of LORAN C as a supplement to existing navigation aids for general aviation aircraft, particularly in mountainous regions of the United States and where VOR coverage is limited was conducted. Flights, initiated in the summer months, extend through four seasons and practically all weather conditions typical of northeastern U.S. operations. Assessment of all the data available indicates that LORAN C signals are suitable as a means of navigation during enroute, terminal and nonprecision approach operations and the performance exceeds the minimum accuracy criteria. GRA

N82-28279* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MEANS FOR CONTROLLING AERODYNAMICALLY INDUCED TWIST Patent

Wolf Elber, inventor (to NASA) Issued 18 May 1982 4 p Filed 28 Sep. 1979 Supersedes N80-16055 (18 - 07, p 0821)
(NASA-Case-LAR-12178-1; US-Patent-4,330,100; US-Patent-Appl-SN-079913; US-Patent-Class-244-48) Avail: US Patent and Trademark Office CSCL 01C

A control mechanism which provides active compensation for aerodynamically induced twist deformation of high aspect ratio wings consists of a torque tube, internal to each wing and rigidly attached near the tip of each wing, which is moved by an actuator located in the aircraft fuselage. As changes in the aerodynamic loads on the wings occur the torque tube is rotated to compensate for the induced wing twist.

Official Gazette of the U.S. Patent and Trademark Office

N82-28280*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DESIGN CONSIDERATIONS AND EXPERIENCES IN THE USE OF COMPOSITE MATERIAL FOR AN AEROELASTIC RESEARCH WING

Clinton V. Eckstrom and Charles V. Spain (Kentron International, Inc., Hampton, Va.) May 1982 11 p refs Presented at 23rd AIAA/ASME/ASCH/AHS Structures, Structural Dyn. and Mater. Conf., New Orleans, 10-12 May 1982
(NASA-TM-83291; NAS 1.15:83291; AIAA-82-0678) Avail: NTIS HC A02/MF A01 CSCL 01C

Experiences in using composite skin material on an aeroelastic research wing used in flight flutter testing are described. Significant variations in skin shear modulus due to stress and temperature were encountered with the original fiberglass laminate skin designed to minimize wing torsional stiffness. These variations along with the sensitivity of wing torsional stiffness to the skin-to-frame attachment method complicated the structural model vibration mode predictions. A wing skin redesign with different fiber orientation and a reduction in the amount of skin-to-frame bonding resulted in more predictable model characteristics without sacrificing design objectives. Design and modeling considerations for future applications are discussed. Author

N82-28282*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.

HELICOPTER VIBRATION SUPPRESSION USING SIMPLE PENDULUM ABSORBERS ON THE ROTOR BLADE Final Report

G. Alvin Pierce and M.-Nabil H. Hanouva [1982] 140 p refs
(Grant NsG-1582)
(NASA-CR-169131; NAS 1.26:169131) Avail: NTIS HC A07/MF A01 CSCL 01C

A comprehensive analytical design procedure for the installa-

The maximum stress, wing tip deflection, root angle of attack, and flutter velocity during the pull up maneuver (static load), the natural frequencies of the wing structure, and the stresses induced in the wing structure due to landing and gust loads are suitably constrained. Both deterministic and probabilistic approaches are used for finding the stresses induced in the airplane wing structure due to landing and gust loads. A wing design is represented by a uniform beam with a cross section in the form of a hollow symmetric double wedge. The airfoil thickness and chord length are the design variables, and a graphical procedure is used to find the optimum solutions. A supersonic wing design is represented by finite elements. The thicknesses of the skin and the web and the cross sectional areas of the flanges are the design variables, and nonlinear programming techniques are used to find the optimum solution. S.L.

N82-29318# Aeronautical Research Labs., Melbourne (Australia).
A DISCUSSION OF THE FLYING QUALITY REQUIREMENTS OF A BASIC TRAINING AIRCRAFT
C. A. Martin Mar. 1982 16 p refs
(AD-A114805; ARL/AERO-TM-337) Avail: NTIS
HC A02/MF A01 CSCL 01/3

This Memo aims to identify flying qualities of importance in a basic training aircraft and also to suggest interpretations of particular military specifications. The proposition is developed that flying qualities which are considered 'good' for an operational aircraft are not necessarily desirable for a training aircraft. GRA

N82-29319*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HEADS UP DISPLAY Patent Application
H. Douglas Garner and William E. Howell, inventors (to NASA)
Filed 28 May 1982 12 p
(NASA-Case-LAR-12630-1; US-Patent-Appl-SN-383384) Avail: NTIS HC A02/MF A01 CSCL 01D

A heads up aircraft display which allows the pilot to view the display without diverting his attention from the scene ahead is disclosed. The display is designed for use on propeller driven aircraft comprised of a radially disposed row of lamps embedded in the rear surface of a propeller. Measurements of flight data are made by conventional means and converted into digital signals. These digital signals are applied to graphic generators which control lamp drivers which in turn control lamps through slip rings. The lamps are lit at the appropriate times during each revolution of the propeller to display the flight data in graphic form to the pilot. The combination of graphic generators and radially disposed lamps embedded in an aircraft propeller enables the pilot to view the display without diverting his attention from the scene ahead. NASA

N82-29321# National Center for Atmospheric Research, Boulder, Colo. Atmospheric Technology Div.
AN EVALUATION OF THE ROSEMOUNT ICE DETECTOR FOR CLOUD WATER CONTENT MEASUREMENTS
E. N. Brown Oct. 1981 19 p refs
(Grant NSF ATM-77-23757)
(PB82-156833; NCAR/TN-183) Avail: NTIS
HC A02/MF A01 CSCL 14B

A Rosemount ice detector was installed on a Research Aviation Facility Queen Air for evaluation. It was used during a winter stratus cloud experiment at Muskegon, Michigan (1978) and also during a cumulus cloud experiment (HIPLEX) in 1980 at Big Spring, Texas. Results indicate that the detector is an extremely sensitive instrument with a reasonable dynamic range. The instrument provides a measurement of icing severity and valid computed water content values only for conditions of small water content and/or low temperature. GRA

N82-29322# Aeronautical Research Labs., Melbourne (Australia).
RESULTS OF T56 ENGINE PERFORMANCE MONITORING TRIAL IN HERCULES AIRCRAFT, FEBRUARY - JULY 1977
D. E. Glenny Apr. 1981 37 p refs
(ARL-MECH-Eng-TECH-MEMO-409; AR-002-277) Avail: NTIS
HC A03/MF A01

An engine performance monitoring trial was carried out on the Hercules aircraft. The engine monitoring procedures were developed as an aid to the flight engineer and the maintenance section, so that the performance of the Allison T56 engines were monitored more closely than was specified in operating procedures, thus enabling engine operation and maintenance action to be carried out more effectively. The trial was conducted on Hercules aircraft, and the initial analysis of results was carried out by personnel who are responsible for maintenance of these aircrafts. Operating instructions for aircrew and maintenance personnel, and the results of the trial are presented. Details of the rationale behind the monitoring procedures and overall conclusions on the trial are given. S.L.

N82-29323*# Teledyne CAE, Toledo, Ohio.
COOLED VARIABLE NOZZLE RADIAL TURBINE FOR ROTOR CRAFT APPLICATIONS
C. Rogo Mar. 1981 205 p refs
(Contract NAS3-22005; DA Proj. 1L1-62209-AH-76)
(NASA-CR-165397; NAS 1.26:165397; Rept-1759) Avail: NTIS HC A10/MF A01 CSCL 21E

An advanced, small 2.27 kb/sec (5 lbs/sec), high temperature, variable area radial turbine was studied for a rotor craft application. Variable capacity cycles including single-shaft and free-turbine engine configurations were analyzed to define an optimum engine design configuration. Parametric optimizations were made on cooled and uncooled rotor configurations. A detailed structural and heat transfer analysis was conducted to provide a 4000-hour life HP turbine with material properties of the 1988 time frame. A pivoted vane and a moveable sidewall geometry were analyzed. Cooling and variable geometry penalties were included in the cycle analysis. A variable geometry free-turbine engine configuration with a design 1477 K (2200 F) inlet temperature and a compressor pressure ratio of 16 1 was selected. An uncooled HP radial turbine rotor with a moveable sidewall nozzle showed the highest performance potential for a time weighted duty cycle. Author

N82-29324*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
QCSEE OVER-THE-WING ENGINE ACOUSTIC DATA
Harry E. Bloomer and Irvin J. Loeffler May 1982 28 p refs
(NASA-TM-82708; E-990; NAS 1.15:82708) Avail: NTIS
HC A03/MF A01 CSCL 21E

The over the wing (OTW) Quiet, Clean, Short Haul Experimental Engine (QCSEE) was tested at the NASA Lewis Engine Noise Test Facility. A boilerplate (nonflight weight), high throat Mach number, acoustically treated inlet and a D shaped OTW exhaust nozzle with variable position side doors were used in the tests along with wing and flap segments to simulate an installation on a short haul transport aircraft. All of the acoustic test data from 10 configurations are documented in tabular form. Some selected narrowband and 1/3 octave band plots of sound pressure level are presented. Author

N82-29325# Exotech Proprietary Ltd., Monterey, Calif.
MULTISTAGE AXIAL COMPRESSOR PROGRAM ON TIP CLEARANCE EFFECTS Contractor Report, May 1979 - Aug. 1981
I. Moyle Aug. 1981 49 p refs
(Contract N62271-80-M-2504)
(AD-A107445; NPS67-81-01CR) Avail: NTIS
HC A03/MF A01 CSCL 21/5

Tip clearance has long been known to be a source of losses in axial compressors with cantilevered blades. The reasons for the losses, however, are not well understood and current practice in engine design still requires extensive effort to maintain constant minimal operating clearances over a wide range of conditions. The emphasis on clearance control may be appreciated by the typical observation that a ten percent change in peak static pressure rise in a compressor stage may occur for a fifty percent change in clearance. Clearances are typically in the one to five percent of major passage dimension range, and thus a small change in passage dimensions represents a large change in clearance. It is clear that, in general, it would be desirable that blading performance be less sensitive to changes in clearance. Less sensitivity would allow a general relaxation of the mechanical tolerances on a compressor assembly and provide more consistent transient performance. The aerodynamics of achieving such a situation are a challenge as the underlying requirement is improved performance at larger clearances. Work toward understanding the basic mechanisms of tip clearance effects with an emphasis on designing for clearance has been commenced at the Naval Postgraduate School Turbopropulsion Laboratory (NPS/TPL). This report summarizes the preliminary work on the Multistage Compressor (MSC) facility at the Laboratory. GRA

N82-29326# Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.
WATER INGESTION INTO AXIAL FLOW COMPRESSORS. PART 3: EXPERIMENTAL RESULTS AND DISCUSSION Final Report, 15 Dec. 1977 - 30 Jun. 1981
T. Tsuchiya, S. N. B. Murthy, C. M. Ehresman, and D. Richards Wright-Patterson AFB, Ohio AFWAL Oct. 1981 268 p refs
(Contract F33615-78-C-2401; AF Proj. 3066)
(AD-A114830; AFWAL-TR-80-2090-Pt-3) Avail: NTIS HC A13/MF A01 CSCL 21/5

The subject of air-water mixture flow in axial compressors of jet engines is of practical interest in two contexts of water ingestion: during take-off from rough runways with puddles of water and during flight through rain storms. The change in the compressor performance in turn produces changes in the performance of other components and of the engine as a whole. During the current investigation, (1) an analysis of the effects of water ingestion into a compressor has been carried out leading to the development of a predictive code, the PURDU-WICSTK program and (2) a series of tests have been carried out on a small test compressor with mixtures of gases (containing methane gas to simulate steam) and with air-water droplet mixtures. The experimental results have been compared with predictions. It is concluded that the basic effects of water ingestion into compressors arise through (1) blockage, (2) distortion and (3) heat and mass transfer processes, the changes in blade aerodynamic performance being relatively small. In the case of a compressor of small mass flow and pressure ratio and high operating speed, increased quantities of water ingestion give rise to large quantities of water in the tip region. GRA

N82-29327# Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.
EFFECT OF WATER ON AXIAL FLOW COMPRESSORS. PART 2: COMPUTATIONAL PROGRAM Final Report, 15 Dec. 1977 - 30 Sep. 1980
T. Tsuchiya and S. N. B. Murthy Wright-Patterson AFB, Ohio AFWAL Jun. 1981 425 p refs
(Contract F33615-78-C-2401; AF Proj. 3066)
(AD-A114831; AFWAL-TR-80-2090-Pt-2) Avail: NTIS HC A18/MF A01 CSCL 21/5

An analysis of the performance of an axial flow compressor operating with mixtures of gases and air-water droplet mixtures was performed. In the case of mixtures of gases, account was taken of the changes in molecular weight and ratio of specific heats. In the case of two phase flow, the major processes of interest are: (1) droplet blade interaction; (2) droplet heating; (3) droplet centrifuging; and (4) droplet break up. The PURDU-WICSTK program developed for the prediction of compressor performance was utilized to obtain the performance of a test compressor. A three dimensional stream line computer code, the UD-0300, was also modified and exercised in the case of compressor operation with mixtures of gases. Water ingestion into the compressor of an aircraft gas turbine engine affects the performance of the engine, and a preliminary analysis of the nature of the effects was also conducted. M.G.

N82-29328# Iowa State Univ. of Science and Technology, Ames. Turbomachinery Components Research Lab.
AERODYNAMICS OF ADVANCED AXIAL-FLOW TURBOMACHINERY Annual Report, 1 Oct. 1980 - 30 Sep. 1981
George K. Serovy, Patrick Kavanagh, and Theodore H. Okiishi Dec. 1981 82 p refs
(Grant AF-AFOSR-0004-80; AF Proj. 2307)
(AD-A114911; ISU-ERI-AMES-82108; TCRL-22; AFOSR-82-0201TR) Avail: NTIS HC A05/MF A01 CSCL 21/5

A multi-task research program on the aerodynamics of advanced axial-flow turbomachinery is continuing at Iowa State University. Program components are intended to result in direct contributions to the improvement of axial-flow fan, compressor, and turbine design procedures. A detailed experimental investigation of intrapassage flow in a large-scale, curved, rectangular cross section channel representative of turbomachinery passages is in progress. Author (GRA)

N82-29329*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AGRICULTURAL AIRPLANE MISSION TIME STRUCTURE CHARACTERISTICS
Joseph W. Jewel, Jr. Jul. 1982 44 p refs
(NASA-TM-84470; L-15125; NAS 1.15:84470) Avail: NTIS HC A03/MF A01 CSCL 01C

The time structure characteristics of agricultural airplane missions were studied by using records from NASA VGH flight recorders. Flight times varied from less than 3 minutes to more than 103 minutes. There was a significant reduction in turning time between spreading runs as pilot experience in the airplane type increased. Spreading runs accounted for only 25 to 29 percent of the flight time of an agricultural airplane. Lowering the longitudinal stick force appeared to reduce both the turning time between spreading runs and pilot fatigue at the end of a working day. Author

N82-29330* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
METHOD FOR REFURBISHING AND PROCESSING PARACHUTES Patent
Russell T. Crowell, inventor (to NASA) Issued 2 Feb. 1982 7 p Filed 30 May 1980 Supersedes N81-14967 (19 - 06, p 0706) Division of US Patent Appl. SN-862878, filed 12 Dec. 1977, US Patent-4,244,810
(NASA-Case-KSC-11042-1; US-Patent-4,313,291; US-Patent-4,244,810; US-Patent-Appl-SN-154663; US-Patent-Appl-SN-862878; US-Patent-Class-53-429; US-Patent-Class-8-150) Avail: US Patent and Trademark Office CSCL 14B

A system and method for refurbishing and processing parachutes is discussed including an overhead monorail conveyor system on which the parachute is suspended for horizontal conveyance. The parachute is first suspended in partially open tented configuration wherein open inspection of the canopy is permitted to remove debris and inspect all areas. Following inspection, the parachute is transported by the monorail conveyor to a washing and drying station with the parachute canopy mounted on the conveyor ina systematic arrangement which permits water and air to pass through the ribbonlike material of the canopy. Following drying of the parachute, the parachute is conveyed into an interior space where it is finally inspected and removed from the monorail conveyor and laid upon a table for folding. Official Gazette of the U.S. Patent and Trademark Office

N82-29331*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
INFLIGHT IFR PROCEDURES SIMULATOR Patent Application
Lloyd C. Parker, inventor (to NASA) Filed 11 Jun. 1982 22 p
(NASA-Case-KSC-11218-1; US-Patent-Appl-SN-387649) Avail: NTIS HC A02/MF A01 CSCL 14B

An in-flight trainer designed to train students in a conventional aircraft is disclosed. The trainer generates simulated signals and commands to conventional instruments provided in the aircraft that correspond to the normal signals a pilot receives during instrument flight rule (IFR) flights and landing and departure procedures. Results of studies conducted using apparatus which demonstrated the concept indicate that the concept is feasible. Also, students trained using only the In-flight IFR Simulator were more proficient in skills development than those trained using table-top simulators and in aircraft in the conventional manner. J.M.S.

N82-29332# Seville Research Corp., Pensacola, Fla.
OPERATIONAL TEST AND EVALUATION HANDBOOK FOR AIRCRAFT TRAINING DEVICES. VOLUME 1: PLANNING AND MANAGEMENT Final Report
Thomas H. Gray, Stephen R. Osborne, Roik I. Hockenberger and James P. Smith Williams AFB, Ariz. Air Force Human Resources Lab. Feb. 1982 72 p refs
(Contract F33615-78-C-0063; AF Proj. 1123)
(AD-A112498; AFHRL-TR-81-44-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 05/9

The handbook, comprised of three volumes, is intended to provide guidelines and procedures appropriate for Air Force Operational Test and Evaluation (OT/E) personnel to use in planning, conducting, and reporting the results of simulator assessment efforts. Although of value of all test personnel, it is primarily for the typical novice test manager/director-a person who has subject matter expertise (e.g., a qualified pilot or operator), but who may have little or no previous OT/E experience. The handbook provides detailed coverage on OT/E planning and management, with special emphasis on measuring device operational effectiveness and suitability. In accord with its objectives, the handbook was prepared to serve as a supplement to Air Force Manual 55-43, 'Management of Operational Test

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Optimal three-dimensional turning performance of supersonic aircraft [AIAA PAPER 82-1326] A82-39103

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Aerodynamic characteristics of a large-scale, twin tilt-nacelle V/STOL model [AIAA PAPER 81-0150] A82-38443

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Analytic extrapolation to full scale aircraft dynamics [AIAA PAPER 82-1387] A82-39143

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data transmission. Performance of this system is evaluated through a computer simulation. (Author)

A82-38422 **The need for a dedicated public service helicopter design.** R. Morrison (Airborne Law Enforcement Association, Inc.; Huntington Beach Police Dept., Huntington Beach, CA). *Vertiflite,* vol. 28, July-Aug. 1982, p. 28-32.

A proposal is made for NASA to undertake a program to develop a technologically-advanced modular helicopter designed specifically for public service use, that is, for emergency medical services, fire fighting, wildlife management, law enforcement, etc. Public service helicopters currently in use have many unattractive features, such as high noise and cost, as a result of their original designs to satisfy military requirements, and are unable to meet the varied needs of public service operators. The proposed helicopter would have a high speed (200-300 knots), combined with effective night, all-weather operation, and could yield national benefits of over $90 billion per year, including: a greater ability to compete with foreign-made helicopters, a reduced response time in emergency situations, a greater effectiveness in law enforcement, and expanded job opportunities in the helicopter industry. N.B.

A82-38423 **JVX, what an opportunity.** C. C. Crawford, Jr. (U.S. Army, Aviation Research and Development Command, St. Louis, MO). *Vertiflite,* vol. 28, July-Aug. 1982, p. 34-39.

US military officials have proposed the creation of a Joint Services Advanced Vertical Lift Aircraft Program (JVX) to design a family of advanced technology vertical lift aircraft which could perform numerous, multi-service missions and achieve initial operating capability in the early 1990s. Six specific roles have been selected from the mission profiles to serve as a basis for molding requirements for a common multi-service air vehicle and the requirement for fulfilling world-wide self-deployment. The six roles - combat search and rescue, long range requirements, special electronics mission, signal intelligence, Marine Corps JVX, and self-deployment - are described in detail and schematics showing each of the mission profiles are included. A technical assessment group, which included representatives of the US Army Aviation Research and Development Command and NASA, reviewed possible configurations for the JVX and determined that tilt rotor configurations appear to offer the best possibility for a common multi-service design since they possess adequate hover efficiency, high-altitude and high speed capabilities as well as world-wide self-deployment. Other configurations studied, including lift/cruise fan configurations, conventional helicopters, and the auxiliary propulsion ABC/compound helicopter, all have serious drawbacks and are considered less attractive for the JVX. N.B.

A82-38439 # **Minimal order time sharing filters for INS in-flight alignment.** I. Y. Bar-Itzhack (Technion - Israel Institute of Technology, Haifa, Israel). *Journal of Guidance, Control, and Dynamics,* vol. 5, July-Aug. 1982, p. 396-402. 19 refs. Research supported by the Israel Aircraft Industries, Ltd., and Ministry of Defence.

Very simple reduced order filters which operate in a time sharing mode are proposed for in-flight and transfer alignment of calibrated inertial navigation systems (INS) such as those in fighter aircraft. The coarsely aligned INS is flown for a short duration in a straight and level flight during which two second-(or third-) order time sharing filters estimate the level misalignment. After removing the estimated level misalignment angles a third-(or fourth-) order filter is switched in to estimate the azimuth misalignment as the aircraft starts to maneuver in the lateral plane. A true covariance simulation is carried out, which shows that the proposed filters successfully perform the fine alignment. (Author)

A82-38441 # **Adaptive filtering for an aircraft flying in turbulent atmosphere.** H. Okubo (Osaka Prefecture University, Sakai, Japan). *Journal of Guidance, Control, and Dynamics,* vol. 5, July-Aug. 1982, p. 410-412. 5 refs.

On the basis of a sensitivity analysis for a simple scalar system, the deterioration of the Kalman filter performance resulting from incorrect noise covariance values is examined. It is found that the increase in the error covariance relative to the optimum value depends largely on the ratio of the process and the measurement noise covariance values. This is considered important in adaptive filtering problems when the system includes noises with extensively variable variance, such as the dynamics of aircraft flying through patches of atmospheric turbulence. C.R.

A82-38442 * # **Robust Kalman filter design for active flutter suppression systems.** W. L. Garrard (Minnesota, University, Minneapolis, MN), J. K. Mahesh, C. R. Stone (Honeywell Systems and Research Center, Minneapolis, MN), and H. J. Dunn (NASA, Langley Research Center, Hampton, VA). *Journal of Guidance, Control, and Dynamics,* vol. 5, July-Aug. 1982, p. 412-414. 6 refs. Contract No. NAS1-15486.

Additional insight is provided into the use of the Doyle-Stein (1979, 1981) technique in aeroelastic control problems by examining the application of the method to a flutter control problem. The system to be controlled consists of a full-size wind tunnel model of a wing, plus an aileron, an actuator, and an accelerometer used to sense the motion of the wing. A full-state feedback controller was designed using linear optimal control theory, and a Kalman filter was used in the feedback loop for state estimation. The filter design procedure is explained along with that to improve closed-loop properties of the system. The locus of the poles of the filter is examined as a scalar design parameter is varied. The Doyle-Stein design procedure is shown to substantially improve the stability properties of an active flutter controller designed using the linear quadratic Gaussian control theory. C.D.

A82-38443 * # **Aerodynamic characteristics of a large-scale, twin tilt-nacelle V/STOL model.** M. D. Falarski, M. R. Dudley (NASA, Ames Research Center, Moffett Field, CA), W. Buchmann (Grumman Aerospace Corp., Bethpage, NY), and A. Pisano (U.S. Naval Air Systems Command, Washington, DC). *(American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 19th, St. Louis, MO, Jan. 12-15, 1981, Paper 81-0150.)* Journal of Aircraft, *vol. 19, Aug. 1982, p. 627-633. 6 refs.*

A subsonic tilt-nacelle V/STOL aircraft configuration is described which is powered by two turbofan engines, mounted on a single carry-through structure that is designed to maintain the thrust axis close to the center of gravity at nacelle incidences of 5-95 deg. Control during V/STOL operation, often from small ship platforms, is achieved by means of a vane assembly that is immersed in each turbofan's exhaust. Wind tunnel test data have been obtained with an 11.2-m wing span model for the vertical-to-horizontal flight transition capability of the concept. It is found that the aircraft can operate over a broad transition corridor, with sufficient maneuver capability about the trim points. The control vane exhibited linear response characteristics over a large deflection range, with little influence from power, angle of attack or ground proximity in hover. The model induced a positive ground effect in hover that increased as wheel height was approached and strake angle increased. O.C.

A82-38445 * # **Influence of unsteady aerodynamics on hingeless rotor ground resonance.** W. Johnson (NASA, Ames Research Center, Low Speed Aircraft Research Branch, Moffett Field, CA). *Journal of Aircraft,* vol. 19, Aug. 1982, p. 668-673. 16 refs.
(Previously announced in STAR as N81-28056)

A82-38446 # **U.S. Marine Corps AV-8A maintenance experience.** L. Scott and R. W. Morrissey (U.S. Naval Air Rework Facility, Cherry Point, NC). *(American Institute of Aeronautics and Astronautics and NASA Ames Research Center, V/STOL Conference, Palo Alto, CA, Dec. 7-9, 1981, Paper 81-2657.)* Journal of Aircraft, *vol. 19, Aug. 1982, p. 694-696.*

The basic structure of the AV-8A employs a 2014T6 aluminum alloy, with an epoxy primer and a polyurethane paint system, which have together been shown by U.S. Marine Corps maintenance experience to be proof against corrosion. The vectorable engine nozzles and their drive system have proven to be so strong and reliable that vectoring has been used in forward flight for air combat maneuvering. Only fatigue damage to the empennage primary structure has been experienced, and this problem is being addressed by a reduction of operational time at high power, together with a rebuilding of the ventral fin with solid rivets. O.C.

A82-38447 # **Estimation of the peak count of actively controlled aircraft.** N. J. Meyerhoff and J. Garlitz (U.S. Department of Transportation, Office of Air and Marine Systems, Cambridge, MA). *Journal of Aircraft,* vol. 19, Aug. 1982, p. 698-700. 5 refs.

It is suggested by an analysis of preliminary data that a regression of the peak number of actively controlled aircraft on total daily operations yields an economical estimate of the peak instantaneous air count (AIC) over various air route traffic control centers (ARTCCs). It is possible to have a single general regression model for the entire continental U.S., or separate models for each ARTCC. In addition, peak models for terminal and en route centers appear possible, and improved estimates of peak ISC may be generated by regressing on component operations, consisting of departures, arrivals and overflights, rather than total daily operations. O.C.

A82-38461 **Complete flexibility and realism in radar simulation.** C. Buttars (International Aeradio, Ltd., Southall, Midox., England). *The Controller,* vol. 21, May 1982, p. 22, 23.

A digital air traffic radar simulator, developed for International Aeradio's air traffic control training school, achieves complete flexibility and realism in all aspects of radar training. The simulator uses a model flight information region to provide radar training capable of being applied anywhere in the world. The system has the capability to operate up to seven studen controller displays, each allowing combined radar/procedural exercises to be run. Three aircraft control units are provided, each capable of controlling 16 aircraft by keyboard input. The electric data display shows full aircraft data, computer replies to keyboard injected demands, and aircraft reports either as a result of keyboard injection or automatically. The simulator is programmed with the performance envelopes of 96 aircraft types (including indicated cruising speeds, rate of climb, descent speeds between three levels, and angles of bank), and allows only realistic flight characteristics. Also programmed are international standard atmosphere, and turn and indicated air speed data, which permit the aircraft to realistically simulate actual flying conditions. N.B.

A82-38462 **Future terminal area systems.** P. A. Jorgensen (Selenia-Industrie Elettroniche Associate S.p.A., Rome, Italy). *(International Federation of Air Traffic Controllers' Associations, West European Conference, Rome, Italy, Nov. 12-14, 1981.) The Controller,* vol. 21, May 1982, p. 34, 35. 6 refs.

The development of a terminal area computer system able to interface with existing flight management systems is discussed, and this type of system is intended to provide greater fuel conservation and air space capacity, with improved safety during the descent phase of flights. The system must be able to forecast a suitable approach routing, which will allow for a continuous descent of each aircraft, while also providing optimal distribution. Utilizing such a system, a controller would concentrate on monitoring the separation between the aircraft and would only rarely need to intervene in the landing process. Studies are being conducted to determine optimum approach patterns for such a system with regard to fuel conservation, safety and airspace capacity. A graph of the actual measured fuel consumption found for three different patterns - the standard descent profile, the low drag/low power approach, and a low drag/delayed flaps approach - is presented. N.B.

A82-38463 **The detection of low level wind shear. II.** P. D. Simmons. *The Controller,* vol. 21, May 1982, p. 36-38.

The Low Level Wind Shear Alert System (LLWSAS), a real-time micro-computer-controlled, data acquisition, analysis and display system for detecting horizontal wind shear near airports, is discussed, and the system's performance since its introduction by the FAA beinning in 1977 is analyzed. The system collects wind direction and wind speed data from six anemometers located near approach and takeoff areas of the airport, computes the wind gusts, and alerts controllers to wind shears by visual and audible alarms, and the information is then relayed to pilots in the area. While proof of the effectiveness of a system of this nature is extremely difficult to establish, it is noted that there have been no wind shear accidents in the US since 1977. One incident attributed to wind shear which occurred in Atlanta in 1979, but did not result in an accident, is discussed in detail. While the LLWSAS did not dectect wind shear conditions, it is shown that the wind shear occurred outside of the range of the system, but at a distance which allowed the pilot to recover and land safely. N.B.

A82-38464 **Fuel conservation: The airline - ATC.** P. M. Grundy. *The Controller,* vol. 21, May 1982, p. 39, 40, 47.

The air traffic control system has a greater impact on fuel conservation than any other factor in aviation, the most energy intensive industry in the world. The article discusses various measures that could be adopted by airlines and air traffic controllers to increase fuel conservation. These include: reducing operating empty weights, flying at optimum altitude, direct routing, linear holding, speed control, flight planning, loading for favorable center of gravity to reduce trim drag, minimizing route mileage, and clearance priorities for more fuel demanding aircraft during landing. N.B.

A82-38474 **A simplified approach to the free wake analysis of a hovering rotor.** R. H. Miller (MIT, Cambridge, MA). *(Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept. 8-11, 1981.) Vertica,* vol. 6, no. 2, 1982, p. 89-95. 19 refs.
(Previously announced in STAR as N82-18121)

A82-38475 **Calculation of the cross section properties and the shear stresses of composite rotor blades.** R. Wörndle (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). *(Deutsche Gesellschaft für Luft- und Raumfahrt, European Rotorcraft and Powered Lift Aircraft Forum, 7th, Garmisch-Partenkirchen, West Germany, Sept 8-11, 1981.) Vertica,* vol. 6, no. 2, 1982, p. 111-129. 10 refs.
(Previously announced in STAR as N82-25334)

A82-38500 # **Wind shear - Its effect on an aircraft and ways to reduce the hazard. II (Uskok wiatru - Dzialanie na samolot, srodki zmniejszajace zagrozenie. II).** J. M. Morawski and T. Smolicz (Instytut Lotnictwa, Warsaw, Poland). *Technika Lotnicza i Astronautyczna,* vol. 37, May 1982, p. 5-8. 7 refs. In Polish.

A82-38722 † **Numerical methods for solving boundary value problems for noncavitating and cavitating flow past wing profiles (Chislennye metody reshenila kraevykh zadach beskavitatsionnogo i kavitatsionnogo obtekanila kryl'evykh profilei).** N. Iu. Zavadovskii, S. S. Maslennikov, and A. A. Rusetskii (Tsentral'nyii Nauchno-Issledovatel'skii Institut, Leningrad, USSR). *Gidromekhanika,* no. 45, 1982, p. 3-12. 6 refs. In Russian.

Algorithms are developed for the numerical solution of the following problems of the steady flow of an ideal incompressible fluid: noncavitating flow past an airfoil section, noncavitating flow past a wing profile, and flow past a profile with partial cavitation. An essential element of these algorithms is the computation of singular integrals and the solution of singular integral equations. S.J.

A82-38781 **Symposium on Flows with Separation, Stuttgart, West Germany, November 23-25, 1981, Reports (Symposium über Strömungen mit Ablösung, Stuttgart, West Germany, November 23-25, 1981, Vorträge).** Symposium sponsored by the Deutsche Gesellschaft für Luft- und Raumfahrt. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1982. 147 p. In German and English. (For individual items see A82-38782 to A82-38786)

Aspects of viscous transonic airfoil flow simulation are considered along with investigations regarding vortex formation at wings with bent leading edges, leading edge separation at delta wings with curved leading edges in supersonic flow, and measurement and visualization of skin friction on the leeside of delta wings in supersonic flow. Attention is given to measurements of velocity distributions in the leading edge vortex of a delta wing by the laser-Doppler procedure, the topological structure of separated flows with three-dimensional boundary conditions, the calculation of boundary layers at fuselages, and a delta wing with a high vortex stability. Other topics investigated are related to an experimental study concerning two- and three-dimensional separation, and a theoretical investigation of separated flows in cascades of fluid kinetic machines. G.R.

A82-38783 # **Investigations regarding vortex formation at wings with bent leading edges (Untersuchungen über die Wirbelbildung an Flügeln mit geknickten Vorderkanten).** U. Brennenstuhl and D. Hummel (Braunschweig, Technische Universität, Brunswick, West Germany). In: Symposium on Flows with Separation, Stuttgart, West Germany, November 23-25, 1981, Reports. (A82-38781 19-02) Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1982. 4 p. In German.

It is pointed out that modern bomber aircraft employ presently almost exclusively wings with bent leading edges. There is currently a shortage of wind tunnel data which can provide detailed information regarding the characteristics of flows around such wings. For these reasons, an experimental program involving the study of a number of wings with the considered characteristics has been conducted in West Germany. The first results obtained in connection with this program have already been reported by Brennenstuhl and Hummel (1981). The present investigation is concerned with the remainder of the results obtained in the investigation. The effect of the angle by which the leading edge is bent on the flow characteristics is considered. Attention is given to measurements concerning the pressure distribution and the flowfield. G.R.

A82-38784 # **Leading edge separation at delta wings with curved leading edges in supersonic flow (Vorderkantenablösung an Deltaflügeln mit gekrümmten Vorderkanten im Überschall).** R. Henke (Berlin, Technische Universität, Berlin, West Germany). In: Symposium on Flows with separation, Stuttgart, West Germany, November 23-25, 1981, Reports. (A82-38781 19-02) Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1982. 14 p. 6 refs. In German.

Leeside flow types for delta wings are considered, taking into account the boundary provided by the Stanbrook-Squire region which divides the separation forms 'leading edge separation' and 'shock induced separation'. Basic information regarding the flow over wings with curved leading edges was obtained in studies conducted by Henke (1980) and by Ganzer and Henke (1981). An evaluation of oil film pictures provided an impression regarding the interference characteristics for the various wing components. A number of graphs are presented for the illustration of the obtained results. Some of the pictures were obtained by means of a vapor screen technique and a schlieren method. G.R.

A82-38785 * # **Measurement and visualization of skin friction on the leeside of delta wings in supersonic flow (Messung und Sichtbarmachung der Wandschubspannungen auf der Leeseite von Deltaflügeln im Überschall).** J. Szodruch (Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, West Germany) and D. J. Monson (NASA, Ames Research Center, Moffett Field, CA). In: Symposium on Flows with Separation, Stuttgart, West Germany, November 23-25, 1981, Reports. (A82-38781 19-02) Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1982. 9 p. 7 refs. In German.

The reported investigation was conducted with the aid of the NASA Ames High Reynolds Number Wind Tunnel. The flow conditions considered involved free stream Mach numbers of 2 and 3, and a Reynolds number of approximately 10,000,000 p. m. The employed model was a delta wing with an angle of 70 deg. A method reported by Tanner (1977) was used for the measurement of the skin friction. This method involves the use of a laser interferometer to determine the change in the thickness of an oil film. The procedure can also be employed for a visualization of skin friction in the form of interferograms. The investigation shows that skin friction measurements can provide a significant contribution to a physical understanding of the flow processes at the delta wing. G.R.

A82-38786 # **Measurements of velocity distributions in the leading edge vortex of a delta wing by the laser-Doppler procedure (Messungen**

Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 513-520.

Results of a fabrication study and materials properties tests of an advanced composite horizontal tail leading edge slat rail for the Japanese PS-1 STOL antisubmarine warfare seaplane are presented. The slat rail was fabricated of carbon fiber satin cloth and a bisphenolic epoxy resin matrix, with co-curing by vacuum injection. Static tests were performed to 100 and 180% of the design load limit and satisfactory results were obtained. Coating the slat rail with silicon grease resulted in good resistance to salt spray, although stiffness was reduced 5% after 24,000 cycles. High and low temperature environmental tests produced no degradation in the material. The composite slat rails had been flown for 1000 hr in flight tests by 1978 and performed to specification. M.S.K.

A82-39897 **Development status of a composite vertical stabilizer for a jet trainer.** K. Takagi and S. Idei (Fuji Heavy Industries, Ltd., Aircraft Engineering Div., Utsunomiya, Tochigi, Japan). In: Composite materials: Mechanics, mechanical properties and fabrication; Proceedings of the Japan-U.S. Conference, Tokyo, Japan, January 12-14, 1981. (A82-39851 19-39) Barking, Essex, England, Applied Science Publishers, 1982, p. 521-528.

Progress in a program to develop a composite materials vertical stabilizer for the next generation Japanese transonic military jet trainer is described. Focusing on graphite/epoxy materials, the tests to date cover small elements, components, and full scale main box trials. The stabilizer is about 2.4 m long with an area of 1.0 sq m, containing a two-spar multirib structure. All component parts are graphite/epoxy except the ribs and root fittings, which are aluminum. Tests have been run to examine the moisture temperature effects, rigidity, strain, and static loading to failure. Results have indicated no inherent difficulty in accepting a composite stabilizer on the trainer. M.S.K.

A82-39929 **Fasteners for composite structures.** R. T. Cole, E. J. Bateh (Lockheed-Georgia, Co., Marietta, GA), and J. Potter (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *(Symposium on Jointing in Fibre-Reinforced Plastics, London, England, July 13, 14, 1982.) Composites,* vol. 13, July 1982, p. 233-240. 16 refs.

The four basic problems with fasteners for composites - galvanic corrosion, galling, installation damage, and low pull-through strength - are identified. Seven special fastener systems for use in composites - bigfoots, semi-tubular rivets, Cherry Buck rivets, stress-wave rivet systems, groove proportioned lockbolts, composite fasteners, and self-tapping screws are described. Survey results are shown indicating that flush, low-load transfer, composite-to-composite joints are the most common in current composite structures. The rationale for selecting the flush head configuration as the modification considered is presented. Test results indicate that 100 deg tension countersink fasteners are the best for sheet thicknesses in excess of the head height. (Author)

A82-39930 **On the bearing strengths of CFRP laminates.** T. A. Collings (Royal Aircraft Establishment, Structures Dept., Farnborough, Hants., England). *(Symposium on Jointing in Fibre-Reinforced Plastics, London, England, July 13, 14, 1982.) Composites,* vol. 13, July 1982, p. 241-252. 12 refs.

Bearing strength measurements have been made on zero, + and - 45, zero, 90 deg and 90 + and - 45 deg carbon fiber reinforced plastic (CFRP) laminates made from three different fibre/resin systems; HTS/914, XAS/914 and HTS/HC 3501. Equations have been derived for predicting the ultimate bearing strengths of constrained pin-loaded holes using a semiempirical approach, and considering the physical conditions governing failure at the hole edge. Experimental results are presented and these show good agreement with those predicted for each of the laminate configurations and fibre/resin systems used. (Author)

A82-39996 † **Numerical solution of a problem concerning transonic flow past a wing-fuselage configuration (Chislennoe reshenie zadachi ob okolozvukovom obtekanii kryla s fiuzeliazhem).** V. I. Savitskii (Tsentral'nyi Aerogidrodinamicheskii Institut, Moscow, USSR). *Gidromekhanika,* no. 46, 1982, p. 41-47. 8 refs. In Russian.

Nonviscous transonic flow past an arbitrary wing-fuselage configuration is analyzed within the framework of the small-perturbation theory. A relaxation method is used in conjunction with a finite-difference scheme. Finite-difference approximations for the relaxation equation and boundary conditions are selected by using nonstationary analogy. To illustrate the method, calculations are carried out for several different wing-fuselage configurations. V.L.

A82-40051 **Noise pollution and airport regulation.** J. L. Helms (FAA, Washington, DC). *Journal of Air Law and Commerce,* vol. 47, Spring 1982, p. 405-412.

Methods are proposed of reversing the trend of curfews and other limitations on airport use that have been adopted across the U.S. in the name of noise reduction or environmental protection. The economic problems caused by airport restrictions are discussed along with the drawbacks of various types of restrictions. The situation in White Plains, New York is used as an example of the progress that can be made by holding litigation against restrictions in abeyance and cooperating with the FAA to bring about quick improvements. An example of a beneficial rule is allowing the quietest planes to operate at night rather than banning night flights altogether, as was the case in White Plains. The litigation route is briefly discussed, and the remedy of seeking systematic solutions is proposed, one combining legislation with FAA review. C.D.

A82-40052 **O'Hare International Airport - Impervious to proposed state efforts to limit airport noise.** M. J. Pavlicek (Schaffenegger, Watson and Peterson, Ltd., Chicago, IL). *Journal of Air Law and Commerce,* vol. 47, Spring 1982, p. 413-448. 199 refs.

The complexity of formulating a legally valid, technologically feasible, and economically reasonable state regulation that effectively abates noise at O'Hare International Airport is demonstrated. The federal responsibility for airport noise, federal preemption and the role of the airport proprietor, and the Illinois Pollution Control Board's jurisdiction over the airport noise proposal before it is briefly discussed, while the proposal itself is dealt with in detail. Particular attention is given to the variance procedure which mandates that the airport proprietor consider certain noise abatement methods which are under the control of another authority. Noise abatement activities that can be directly implemented by the proprietor, those that require federal approval, and those that are controlled by local zoning authorities are discussed. C.D.

A82-40057 **Touchdown technology.** J. Moxon. *Flight International,* vol. 122, July 24, 1982, p. 215-217.

The introduction of widebodied jets brought on a need for modifications in tires, brakes, and wheels to accommodate for weight. Radial tires are being tested as they offer a 15-20% weight reduction. Also, tires made of Guayule, a wild desert plant found in the southern United States and Mexico, are being tested. The evolution of brakes is discussed, with the most recent development being the use of carbon disks as they absorb more kinetic energy than steel without overheating. Carbon also offers weight reduction and long life, but a more cost efficient production method is being investigated. Variations in wheel production have been minimal and the current focus is on safety improvements and the use of titanium and aluminum alloys. NASA is studying a new landing method which involves the active control of landing gear so that forces transmitted to the airframe are reduced. R.K.R.

A82-40124 **Two-dimensional model studies of the impact of aircraft exhaust emissions on tropospheric ozone.** R. G. Derwent (Atomic Energy Research Establishment, Harwell, Oxon, England). *Atmospheric Environment,* vol. 16, no. 8, 1982, p. 1997-2007. 38 refs. Research sponsored by the Department of Environment.

The potential effects of aircraft operations in the troposphere were investigated with a two-dimensional (latitude-altitude) transport-kinetics model. There appears to be reasonable agreement between the present and previous studies that aircraft operations may have already increased ozone concentrations in the upper troposphere by up to a few per cent or so. The corresponding increases in the total ozone column amount to a few tenths of a per cent and may well have partially offset any decrease due to the release of chlorofluorocarbons 11 and 12. (Author)

A82-40276 # **Flying quality requirements for V/STOL transition.** C. G. Carpenter, J. Hodgkinson (McDonnell Aircraft Co., St. Louis, MO), R. H. Hoh (Systems Technology, Inc., Hawthorne, CA), and J. W. Clark, Jr. (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1293 . *8 p. 7 refs.*

A landing approach criterion showed excellent correlation of heave damping and pitch-to-path coupling effects. Blending schemes for transition from approach dynamics to hover dynamics, and vice versa, correlated well with earlier NASA results. A time response criterion discriminated well between attitude and rate systems in low speed and hover. Pilot's command gain has a strong effect on piloting charactersitics in all phases of transition. (Author)

A82-40287 # **Flying qualities requirements for roll CAS systems.** D. G. Mitchell and R. H. Hoh (Systems Technology, Inc., Hawthorne, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1356.* 9 p. 8 refs. Contract No. F33615-80-C-3604.

Command augmentation systems (CAS) are becoming essential components for modern fighters. A roll rate CAS utilizes an effective feedforward so that pilot control inputs are compared directly to actual roll response. Such CASs, as they are used today, can be limited in authority with parallel direct links, or full-authority with high command gains. The latter are the more interesting from a handling qualities standpoint. Attention is given to gradient shaping, roll responses for conventional aircraft, roll CAS gradients, roll ratcheting, implications for the handling qualities standard, roll performance, linearity, the roll mode time constant, and aspects of sensitivity. G.R.

A82-40290 * # **Flight-determined correction terms for angle of attack and sideslip.** M. F. Shafer (NASA, Flight Research Center, Edwards, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1374.* 11 p.

The effects of local flow, upwash, and sidewash on angle of attack and sideslip (measured with boom-mounted vanes) were determined for subsonic, transonic, and supersonic flight using a maximum likelihood estimator. The correction terms accounting for these effects were determined using a series of maneuvers flown at a large number of flight conditions in both augmented and unaugmented control modes. The correction terms provide improved angle-of-attack and sideslip values for use in the estimation of stability and control derivatives. In addition to detailing the procedure used to determine these correction terms, this paper discusses various effects, such as those related to Mach number, on the correction terms. The use of maneuvers flown in augmented and unaugmented control modes is also discussed. (Author)

A82-40294 * # **The use of linearized-aerodynamics and vortex-flow methods in aircraft design /Invited paper/.** J. E. Lamar (NASA, Langley Research Center, Transonic Aerodynamics Div., Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1384.* 17 p. 41 refs.

This paper deals with selected linearized-aerodynamic and vortex-flow methods as applied to aircraft design problems at high subsonic speeds. In particular, the NASA Vortex Lattice and Modified Multhopp methods are the linearized techniques employed, and the suction analogy is used to provide estimates associated with vortex-flow aerodynamics. Many examples are given as to how researchers at Langley have used these methods to design the high subsonic, wing-mean-camber shapes for various configurations such as a supersonic transport, high-aspect-ratio transport, trapezoidal fighter wing, strake wing, tandem wing, joined wing, delta wing, and slender cranked wing. Many of these have been built, tested, and have had their data compared with theory. In addition, a technique for defining efficiently performing strake planforms for use in strake-wing combinations is discussed, and further improvements in wing design are outlined. The latter may be obtained by using higher-ordered linear panel methods as well as nonlinear-transonic methods. (Author)

A82-40348 **Boeing's new 767 eases crew workload.** R. R. Ropelewski. *Aviation Week and Space Technology*, vol. 117, Aug. 23, 1982, p. 40, 41, 43 (3 ff.).

Details of the cockpit avionics and control switches and their operations in the Boeing 767 aircraft are described. Automation of the control and monitoring of most aircraft functions has permitted elimination of the flight engineer's station, and all controls are now within reach of the pilot and copilot. Each pilot is furnished electronic attitude director and horizontal situation indicators and flight management system control display units, in addition to sharing two centrally located 6 x 7 in. electronic displays giving engine indication and crew alerts. Standard electromechanical gages remain as a redundant feature, while checklist procedures are reduced to a short time. Flight paths and travel times are currently being programmed for easy access loading into the flight computer for automated guidance, with the computer tuning to navigations aids stationed along the flight path. M.S.K.

A82-40395 # **Summary of sting interference effects for cone, missile, and aircraft configurations as determined by dynamic and static measurements.** B. L. Uselton and D. R. Haberman (Calspan Field Services, Inc., Arnold Air Force Station, TN). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1366.* 16 p. 21 refs.

A summary of an AEDC technology program of sting effects on aerodynamic measurements is presented. Four different configurations - a 7-deg cone, 6-deg sliced-base cone, missile and an aircraft - were tested in the wind tunnel. Interference effects were obtained by measurements of damping derivatives, static data, surface pressures, and base pressures from subsonic to hypersonic Mach numbers. The critical sting limits were investigated as a function of frequency of oscillation, model boundary layer, type of measurement, angle of attack, Mach number, and configuration. Comparisons of wind tunnel and ballistic range data are presented for the missile and aircraft configurations. Critical sting length was found to be dependent on the parameter selected as the interference indicator. (Author)

A82-40417 * # **NASA research in supersonic propulsion - A decade of progress.** L. H. Fishbach, L. E. Stitt, J. R. Stone, and J. B. Whitlow, Jr. (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1048* . 23 p.
(Previously announced in STAR as N82-26300)

A82-40418 * # **Propulsion opportunities for future commuter aircraft.** W. C. Strack (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1049.* 26 p. 9 refs.
(Previously announced in STAR as N82-26298)

A82-40419 * # **Summary and recent results from the NASA advanced high-speed propeller research program.** G. A. Mitchell and D. C. Mikkelson (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1119.* 34 p. 37 refs.
(Previously announced in STAR as N82-26219)

A82-40420 * # **Performance of a 2D-CD nonaxisymmetric exhaust nozzle on a turbojet engine at altitude.** D. M. Straight and R. R. Cullom (NASA, Lewis Research Center, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1137* . 27 p. 14 refs.
(Previously announced in STAR as N82-26241)

A82-40422 * # **Comparison of experimental and analytic performance for contoured endwall stators.** R. J. Boyle (NASA, Lewis Research Center, Cleveland, OH) and J. E. Haas (U.S. Army, Propulsion Laboratory, Cleveland, OH). *AIAA, SAE, and ASME, Joint Propulsion Conference, 18th, Cleveland, OH, June 21-23, 1982, AIAA Paper 82-1286.* 14 p. 18 refs.
(Previously announced in STAR as N82-26299)

A82-40428 # **Terrain following/terrain avoidance system concept development.** G. D. Young, Jr., W. W. Harrington, R. L. Overdorf, and E. Rachovitsky (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Guidance and Control Conference, San Diego, CA, Aug. 9-11, 1982, Paper 82-1518.* 8 p. 6 refs. Grant No. F33615-80-C-3617.

The development of a real-time simulation of a terrain following/terrain avoidance (TF/TA) system algorithm for use with an operating AFTI/F-16 simulator is described. The simulator is equipped with a control feel system, a single seat cockpit, an earth/sky and a target/terrain projection system, and motion and g-force provisions. A 5000:1 scale scenario of western Europe was chosen with night, dusk, and daylight capability in addition to cloud cover and weather configurations. The TF/TA control system is considered in terms of a preplanned ground track, with the mission proceeding from waypoint to waypoint, a computed flight path, for optimized aircraft performance on trajectories within the mission path, and aircraft control to follow the actual flight path. A feasible directions algorithm for obtaining the computed flight path is presented and operations are described. Further developments to complete the pilot-in-the loop strategies are discussed. M.S.K.

A82-40429 * # **Flight experience with a backup flight-control system for the HiMAT research vehicle.** R. W. Kempel (NASA, Flight Research Center, Edwards, CA). *American Institute of Aeronautics and Astronautics, Guidance and Control Conference, San Diego, CA, Aug. 9-11, 1982, Paper 82-1541.* 20 p.

The NASA Dryden Flight Research Facility is conducting flight tests of two remotely piloted, subscale, advanced fighter configurations; the tests are part of the Highly Maneuverable Aircraft Technology (HiMAT) project. Closed-loop primary flight control is performed from a ground-based cockpit and digital computer in conjunction with an up/down telemetry link. A significant feature of these vehicles is an on-board, digitally active, backup control system designed to recover the vehicle in the event of a transfer from primary control. Automatic transfers occur upon certain critical ground or airborne system malfunctions. Control modes are provided that enable a ground or airborne controller to guide the vehicle to a safe landing. This paper describes the features, operational development, and flight evaluation of the HiMAT backup flight control system. (Author)

A82-40434 # **Analytical design and validation of digital flight control system structure.** D. B. Mulcare, W. G. Ness, and R. M. Davis (Lockheed-Georgia Co., Marietta, GA). *American Institute of Aeronautics and Astronautics, Guidance and Control Conference, San Diego, CA, Aug. 9-11, 1982, Paper 82-1626.* 11 p. 17 refs.

Flight controls applications continue to be a dominant driver of applied digital technology, especially in the areas of fault-tolerant computer subsystems and flight-critical assurance methods. The present investigation is concerned with two of the major digital flight system technology needs, taking into account system validation technology and integrated methodology. Attention is given to the integration of assurance activities or provisions into the design process. The problem at hand is to formulate, develop, and validate an analytically based methodology which can dependably yield a readily validatable and maintainable digital flight control system. Questions of basic strategy are considered along with the technical approach, the control of complexity, a design description, aspects of system validation, and questions of development methodology. G.R.

A82-40943 # Optimal open-loop aircraft control for go-around maneuvers under wind shear influence. H. G. Jacob (Braunschweig, Technische Universität, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 654-664. 24 refs.

The optimization procedure is based on the representation of time dependent command inputs by analytical functions. The coefficients of these functions are iterated by a static search algorithm to values optimizing the behavior of the process. The longitudinal motion in heavy tail wind shear of the Airbus A 300 aircraft is described by a system of nonlinear equations of 4th order bounded by numerous design, safety and comfort constraints. The quality criterion is defined in a way to maximize the minimal distance between aircraft and ground as well as the area between flight path and ground. For these studies a very simple optimization program has been used which allows to consider boundaries and which comprises less than 100 FORTRAN-statements. The optimal input functions and other interesting variables are shown and discussed for the particular case that full power is available and for half power. (Author)

A82-40944 # The nonsynchronous whirls of the turbine rotor in aerojet engines. J.-L. Gu and P.-Z. Ren (Northwestern Polytechnical University, Xian, Shaanxi, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 665-673. 12 refs.

Several factors involved in the stability analyses of the supercritical overhung-rotor-bearing system of a specific type of aircraft engine are discussed. The phenomenon of 1/2 order subharmonic vibration within aerojet engines and its causes are assessed, and mathematical expressions for destabilizing forces are worked out. The latter include the unbalanced torque force due to circumferential variations of blade tip clearances, the frictional moment within splined coupling, and the aeroelasticity of labyrinth seals. Mathematical expressions for parametric excitation are found for the nonlinear stiffness of single-row deep-grooved ball bearings and for the nonlinear stiffness of the back support. Equations of motion of the high-speed overhung turbine rotor are derived. C.D.

A82-40945 # Fluctuating forces and rotor noise due to distorted inflow. G. Neuwerth, R. Staufenbiel, A. Kellner, and J. Schreier (Aachen, Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 674-688. 14 refs.

The influence of inflow distortions on the rotor blade forces and on their increased radiated noise is theoretically and experimentally investigated. Two types of distortions are considered, one involving a ducted rotor whose inflow is distorted by wakes, the other involving a helicopter tail rotor cutting the tip vortices of the main rotor. Fluctuations in the direction and magnitude of the flow relative to the blades is Fourier analyzed and the unsteady blade forces and pressures are computed on the basis of two and three-dimensional theories. The Fourier coefficients of these forces are used to compute the additional rotor noise emission due to the inflow distortions. Measurements of the unsteady blade pressures and the radiated noise power spectrum are in reasonable agreement with the theoretical results. C.D.

A82-40946 # An experimental and numerical study of 3-D rotor wakes in hovering flight. M. Nsi Mba, D. Favier, and C. Maresca (Aix-Marseille I, Université, Marseille, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 689-699. 12 refs. Direction des Recherches, Etudes et Techniques *Contract No. 78-456.*

Results of comparison between experimental and numerical studies on the 3-D wake of a hovering rotor are presented. The wind-tunnel investigation is conducted by means of X-hot wires and laser Doppler anemometry procedures to measure the 3-D velocity field under the rotor and to determine the tip vortex paths for several rotor configurations. Additional flow visualizations and rotor airloads coefficients are also carried out. The prediction model is based on the classical vortex theory with an empirically prescribed geometry of the wake. From the blade circulation distribution the rotor wake is represented by vortex lines which are allowed to freely adapt until a converged wake geometry is obtained. Then a new estimate of the blade circulation repartition can be deduced. The procedure is repeated, iterating until the compatibility between the adapted wake geometry and the blade circulation repartition is obtained. The validity range of the calculation model is deduced from comparison with experimental data obtained on instantaneous velocities and tip vortex paths, for different rotor parameters including solidy, number of blades, pitch angle, blade twist, and tip shape. (Author)

A82-40947 * # Aerodynamic interactions between a 1/6-scale helicopter rotor and a body of revolution. M. D. Betzina (NASA, Ames Research Center, Moffett Field, CA) and P. Shinoda (U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 700-711. 6 refs.

A wind-tunnel investigation was conducted in which independent, steady-state aerodynamic forces and moments were measured on a 2.24-m-diam, two-bladed helicopter rotor and a body of revolution. The objective was to determine the interaction of the body on the rotor performance and the effect of the rotor on the body aerodynamics for variations in velocity, thrust, tip-path-plane angle of attack, rotor/body position, and body nose geometry. Results show that a body of revolution near the rotor can produce significant favorable or unfavorable effects on rotor performance, depending on the operating condition. Body longitudinal aerodynamic characteristics are significantly modified by the presence of an operating rotor and hub. (Author)

A82-40948 # The prediction of propeller/wing interaction effects. A. S. Aljabri (Lockheed-Georgia Co., Marietta, GA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 712-719.

An analytical technique has been developed which predicts the influence of a propeller slipstream on a nacelle/wing combination. This is achieved by coupling a slipstream code with a complex configuration potential flow analysis code. The slipstream code is based on the vortex theory of propellers and predicts the slipstream in terms of its shape induced velocities and swirl angle. To verify the slipstream code two experiments with different model propellers were carried out. The wake immediately behind these propellers was surveyed and results compared with predictions. Good correlation is obtained. The coupling of the slipstream code with the panel code allows analysis of propeller slipstream/-nacelle/wing combinations. Results comparing the wing spanwise loading with and without slipstream are presented. The computational results are found to be in good agreement with experimental data. (Author)

A82-40949 # Wind-tunnel testing of V/STOL configurations at high lift. W. R. Sears (Arizona, University, Tucson, AZ). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 720-730. 12 refs. Contract No. N00014-79-C-0010.

The results of a study of the problem of the large airstream deflections involved in wind-tunnel testing of V/STOL configurations are reported. The concept of adaptive wind-tunnel walls is utilized to eliminate, along with boundary interference, the inaccuracies of the usual tunnel calibration. Some numerical models of adaptive-wall tunnels are described and it is shown that the undisturbed stream direction and magnitude, arbitrarily chosen, are achieved by the iterative process of such a tunnel. The use of this type of tunnel in an extreme case is demonstrated by constructing and model testing an approximate panel representation of a jet-flap wing of finite span. The demonstration is completely sucessful, suggesting that the new tunnel would solve the recurring problem of V/STOL testing. C.D.

A82-40950 # Estimation of simulation errors in the European Transonic Wind Tunnel /ETW/. B. Wagner (Dornier GmbH, Friedrichshafen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 731-740. 22 refs. Bundesministerium für Forschung und Technologie *Contract No. LVW-7901; European Transonic Wind Tunnel* Contract No. 79/01/68730/143963.

Simulation errors in cryogenic wind tunnels caused by real gas effects, changes in viscosity and heat conductivity characteristics at low temperatures, heat transfer, and local condensation are estimated theoretically. For this purpose viscous effects and heat transfer influences in transonic high Reynolds number turbulent flows are calculated by solving numerically the full Navier-Stokes equations for shock wave boundary layer interactions and by calculating boundary layers on airfoils, real gas equations of state and non-adiabatic walls being included in both procedures. Equilibrium condensation approximating the case of heterogeneous nucleation is investigated in transonic airfoil flows by means of numerical solutions of the full inviscid Eulér equations. The separation behavior is shown not to be sensitive to real gas effects and small amounts of heat transfer. The condensation influence is primarily seen by a considerable drag increase. (Author)

A82-40953 # Prediction of high alpha flight characteristics utilizing rotary balance data. W. Bihrle, Jr. (Bihrle Applied Research, Inc., Jericho, NY). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 781-788.

Rotational flow aerodynamic data, as measured by a rotary balance at low Reynolds number, are used to analytically predict steady spin modes and post-stall motions. The excellent agreement obtained between predicted and full-scale flight results would indicate that use of low Reynolds number rotary balance data is sufficient for calculating steady-spin modes for military configurations and general aviation configurations not having large wing leading-edge radii. Considerations, however, in the application of these low Reynolds number data to steady-state spin analysis, as well as large angle, six degree-of-freedom high alpha studies, are discussed. Also, the procedure for developing a configuration highly resistant to spins is illustrated. (Author)

A82-40955 # **Experimental and theoretical studies of three-dimensional turbulent boundary layers on an empennage of a typical transport airplane.** H. C. Seetharam, N. J. Pfeiffer, M. Ohmura, and J. D. McLean (Boeing Commercial Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 784-795. 6 refs.

This paper describes experiments conducted to measure the three-dimensional incompressible turbulent boundary layers on the horizontal and vertical tails of a 1/5 scale model of a transport airplane empennage. The boundary layer measurements were made with a V-shaped anemometer with a high precision traversing mechanism. Variations of angle of attack and Reynolds number were included in the tests. Measurements were also made with small elevator and rudder deflections. The data includes extensive pressure distributions, and detailed analyses of three-dimensional boundary layer data. Comparison of the experimental data with a three-dimensional boundary layer code taking into account viscous-inviscid interaction is shown. Details of the test theory comparison and the need for a better turbulence model are discussed. (Author)

A82-40956 # **Requirements and trends in fuel consumption in transport mission with aircraft and surface vehicles.** G. Gabrielli. In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 796-799.

A discussion is presented of the energy utilization factor, f, which relates the payload product of a vehicle, yielded by weight and route distance, to the mechanical energy used. Values of f are presented which have been derived from several hundred sea, land and air vehicles of 15 different types in view of their customary missions. It is demonstrated that turboprop aircraft, and to an even greater degree turbojet aircraft, are the only types of vehicles which offer higher transport speeds without a corresponding reduction in the energy utilization factor. O.C.

A82-40957 # **Aerodynamic concepts for fuel-efficient transport aircraft.** G. Krenz and R. Hilbig (Vereinigte Flugtechnische Werke GmbH, Bremen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 800-810. 8 refs.

The rapid inflation of jet fuel prices in the last decade contributes largely to the growing operating expenses of the airlines and to a disproportionate share of the Direct Operating Costs (D.O.C.) as well, wherein the fuel share is already dominant. This report describes the influence of the increasing fuel costs on the aircraft design and explains the manner in which the lift/drag ratio as design parameter is steadily increasing in importance compared to the weight. The evaluation of the fundamentals for a new fuel efficient aircraft is a challenge for both, designer and aeronautical research. On the other hand there still exist potentials for performance improvements in terms of L/D for most of the current aircraft in service, as they were generally designed for minimum weight performance. This paper gives examples for aircraft modifications for performance improvement and shows potentials for future designs in the field of aerodynamics. (Author)

A82-40958 # **Progress at Douglas on laminar flow control applied to commercial transport aircraft.** W. E. Pearce (Douglas Aircraft Co., Long Beach, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 811-817.

Design studies, development efforts and testing related to laminar flow control for subsonic commercial transport aircraft are described in this paper. The paper covers selection of a suitable suction surface, integration of the suction system, and results of LFC aircraft design studies. Current programs which include wind tunnel testing and flight testing are discussed as well as proposed future LFC activities. (Author)

A82-40959 # **Cracks interacting with contact forces - A finite element study on loaded holes.** H. Ansell and B. Fredriksson (Saab-Scania AB, Linköping, Sweden). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 818-826. 17 refs. Research supported by the Forsvarets Materielverk.

A computerized method for the simultaneous solution of the contact and stress intensity factor problem has been developed. The solution is based upon the finite element method using virtual crack extension method for stress intensity factor calculations. The method is generally applicable to both two- and three-dimensional problems and both through- and part-through cracks could be studied. The method has been applied to a lug with prestressed sleeve and shaft. Both single- and doublesided cracks are studied. Contact pressures and stress intensity factors during crack propagating are presented. The stress intensity factors are compared with experimental results. The importance of the simultaneous solution of the contact and crack problem is demonstrated. (Author)

A82-40961 # **A crack growth model under spectrum loading.** S.-X. Yang (Beijing Institute of Aeronautics and Astronautics, Beijing, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 837-843. 12 refs.

In the present study, based on the mechanisms of delayed retardation of overload retardation effect, an analytical equation for predicting the delayed retardation parameter is presented. Further, a model for predicting the retardation under tensile overloads and tensile-compressive overloads is proposed, and it can be used to predict the fatigue crack growth rate and fatigue life under complex spectrum loading. And as an example, the retardation effects of some materials under different loading conditions are predicted. The fatigue life of stiffened panel of wing and landing gear of aircraft under complex spectrum loadings are predicted. Predictions agree very well with experimental results. (Author)

A82-40962 # **Age exploration in naval aviation.** A. D. Williams (U.S. Navy, Naval Aviation Logistics Center, Patuxent River, MD). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 844-850.

In this paper, an overview of the United States Navy's newly developed aviation age exploration process is given. As age exploration is a subset of the Reliability-Centered Maintenance (RCM) program, the underlying concepts of age exploration, RCM, and their relationship to each-other, are explored. Age exploration is depicted as a multi-faceted analyzation, marrying diverse types of information with maintenance engineering logic and statistical formulation. Specific applications of the age exploration process in the Navy's aviation community are presented. It is shown how the knowledge gained from age exploration enables the designer of the RCM requirements to effect maximum uptime of the equipment at the lowest cost within the bounds of safety. (Author)

A82-40963 # **Logistics research program in the United States Air Force.** J. C. Reynolds and P. E. Davidson (USAF, Coordinating Office for Logistics Research, Wright-Patterson AFB, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 851-853.

An assessment is given of the factors which contribute to the lack of interest and investment of resources in logistics research and development, with emphasis on the need to integrate the consideration of logistics into research and development activities, and attention to the program developed toward that end by the U.S. Air Force. USAF program results demonstrate that any agency with logistics responsibilities can improve its technical capabilities and operational methods through management attention and the cooperation of the logistics and research and development communities. O.C.

A82-40964 # **Third generation turbo fans.** J. F. Coplin (Rolls-Royce, Ltd., Derby, England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 857-878.

The modular design concept of the RB211 family of turbofan aircraft engines has allowed the progressive improvement of fuel efficiency through refinement of the design of individual components, resulting in gradual increases of optimum pressure and bypass and temperature ratios. The RB211-535E4, which is the latest engine derived from the basic RB211 design and is destined for use by the 757 airliner, incorporates inherent precision tip clearance control, thermal barrier coatings, creep-resistant titanium alloys, supercritical airfoil designs, a single tion of simple pendulums on the blades of a helicopter rotor to suppress the root reactions is presented. A frequency response analysis is conducted of typical rotor blades excited by a harmonic variation of spanwise airload distributions as well as a concentrated load at the tip. The results presented included the effect of pendulum tuning on the minimization of the hub reactions. It is found that a properly designed flapping pendulum attenuates the root out-of-plane force and moment whereas the optimum designed lead-lag pendulum attenuates the root in-plane reactions. For optimum pendulum tuning the parameters to be determined are the pendulum uncoupled natural frequency, the pendulum spanwise location and its mass. It is found that the optimum pendulum frequency is in the vicinity of the excitation frequency. For the optimum pendulum a parametric study is conducted. The parameters varied include prepitch, pretwist, precone and pendulum hinge offset. Author

N82-28283# Rockwell International Corp., Cedar Rapids, Iowa.
DELTA ELECTRICAL LOAD ANALYSIS C-141B JACC/CP AIRCRAFT
G. R. Taylor 10 Mar. 1982 9 p
(Contracts F09603-80-C-0602; F09603-81-C-1953)
(AD-A113761) Avail: NTIS HC A02/MF A01 CSCL 01/3

The installation of the provisions to accept the JACC/CP Capsule in the C-141B Aircraft causes a change to the electrical loads within the present aircraft power distribution system. The purpose of this report is to furnish a tabulation of the changes to the aircraft power system caused by this installation. GRA

N82-28284# Boeing Military Airplane Development, Seattle, Wash.
ADVANCED AIRCRAFT ELECTRICAL SYSTEM CONTROL TECHNOLOGY DEMONSTRATOR. PHASE 1: ANALYSIS AND PRELIMINARY DESIGN Interim Report, 1 Mar. - 30 Sep. 1981
T. R. Boldt, G. L. Dunn, D. E. Hankins, P. J. Leong, and I. S. Mehdi Wright-Patterson AFB, Ohio AFWAL Jan. 1982 134 p refs
(Contract F33615-80-C-2004; AF Proj. 3145)
(AD-A113633; D180-25927-3; AFWAL-TR-81-2128) Avail: NTIS HC A07/MF A01 CSCL 10/2

This report summarizes Task 1-Requirements Analysis and Task 2-Conceptual Design and documents the results of Task 3, Phase I, of this two-phase program. Task 3 is the preliminary design of an advanced aircraft electrical system (AAES). The AAES is designed to meet the requirements of a 1990 time frame two-engine tactical aircraft with multi-mission capability. The AAES performs the functions of power generation, distribution and control of power to loads, system protection, and load management. Key characteristics of the AAES are: Integrated avionics and power data bus configuration consisting of Digital Avionics Information System (DAIS) standard elements (MIL-STD-1750 processor, MIL-STD-1553B data bus, controls and displays, and remote terminals (RT)). Intelligent Electrical Load Management Centers (ELMC) capable of controlling power to loads; Built-in-test (BIT) capability to isolate faults to the module level. BIT includes both circuit and data monitoring checks. Solid State Power Controllers (SSPC) to replace circuit breakers and power control switches. SSPCs are turned on/off via computer control. Generator control, protection and status monitoring by a Generator Control Unit (GCU) compatible with DAIS hardware and software. Multimission data information system through programmable system processors, ELMCs and standard DAIS elements. Automatic load management for increased aircraft survivability and probability of mission completion. GRA

N82-28285# National Research Council of Canada, Ottawa (Ontario). Flight Research Lab.
EVALUATIONS OF HELICOPTER INSTRUMENT-FLIGHT HANDLING QUALITIES
S. R. M. Sinclair and S. Kereliuk Jan. 1982 49 p refs In ENGLISH; FRENCH summary
(AD-A114004; NRCC-LR-608) Avail: NTIS HC A03/MF A01 CSCL 01/2

The NAE Airborne Simulator, a modified and suitably equipped Bell 205A helicopter, was used in experiments to provide background information on the handling qualities requirements for helicopter instrument flight. This investigation was in support of a regulatory review undertaken by the U.S. Federal Aviation Administration as part of an overall assessment of the helicopter certification process. The results illustrate the inter-dependence of the various stability and control characteristics which contribute to safe instrument flight handling qualities, and underline the importance of good mission simulation in conducting certification-related experiments. Author (GRA)

N82-28286# McDonnell Aircraft Co., St. Louis, Mo.
ADVANCED TRENDING ANALYSIS/EDS DATA PROGRAM Final Report, May 1979 - Sep. 1981
David C. Perryman Wright-Patterson AFB, Ohio AFWAL Jan. 1982 181 p refs
(Contract F33615-78-C-2070; AF Proj. 3066)
(AD-A113511; AFWAL-TR-81-2125) Avail: NTIS HC A09/MF A01 CSCL 09/2

Ground, flight, and maintenance data was collected during the F-15/F100 Engine Diagnostic System (EDS) Flight Evaluation and provided to the Air Force Aero-Propulsion Laboratory (AFWAL/POTC). This data was used by the Air Force, in a concurrent program, to verify a gas turbine engine fault detection/isolation and health trending algorithm employing gas path analysis. In addition, the EDS Flight Evaluation served as a demonstration vehicle for a prototype Maintenance Information Management System (MIMS). Independent assessments of the gas path analysis algonthm and of the prototype MIMS were performed and the results are presented. Several lessons learned about the automatic recording of in-flight trending data for high performance gas turbine engines in modern tactical aircraft are also presented. Author (GRA)

N82-28287# Ballistic Research Labs., Aberdeen Proving Ground, Md.
KINEMATIC INVESTIGATION HUGHES HELICOPTER 7.62mm CHAIN GUN
R. P. Kaste Feb. 1982 48 p refs
(DA Proj. 1L1-62617-AH-19)
(AD-A113114; AD-F300017; ARBRL-MR-03157) Avail: NTIS HC A03/MF A01 CSCL 19/6

A kinematic study of the Hughes Helicopter 7.62mm Chain Gun was performed to determine the power required to operate the weapon and loads on the stud roller due to the various components of the weapon. Using a 24-volt battery system the gun drew up to 60 amperes to start and operated on 22 amperes. The stud roller carries a load up to 497 Newtons. GRA

N82-28288# General Dynamics/Fort Worth, Tex.
RESEARCH MODEL WING/TAIL FABRICATION Technical Report, 17 Aug. 1981 - 18 Jan. 1982
Ronald A. Cox Mar. 1982 9 p
(Contract N00014-81-C-0680)
(AD-A114101; FZA-535) Avail: NTIS HC A02/MF A01 CSCL 14/2

The design and construction of a transonic wind-tunnel model has been completed. The 1/7.5-scale model can be equipped with an all-flying low-, mid-, or T-tail. A baseline, linear element wing and an alternate wing of identical planform, but with chordwise airfoil sections optimized for transonic cruise, have been manufactured. One row of pressures is located on each wing and on the horizontal tail. Author (GRA)

N82-28289# Army Aviation Engineering Flight Activity, Edwards AFB, Calif. Directorate for Development and Qualification.
HISS CALIBRATION, ICE PHOBICS AND FAA R/D EVALUATIONS Final Report, Jan. - Mar. 1981
John C. Henderson, Ralph Woratschek, and Loran A. Haworth Aug. 1981 62 p refs
(AD-A114435; USAAEFA-80-13) Avail: NTIS HC A04/MF A01 CSCL 01/3

Artificial and natural icing tests of a JUH-1H helicopter were flown in the vicinity of St. Paul, Minnesota, during the three month period of January through March 1981. Productive flight time totaled 15.4 hours in the artificial icing environment behind the Helicopter Icing Spray System (HISS) and 3.2 hours in natural icing. Test conditions ranged from -5 C to -20 C and 0.25 to 1.0 gram per cubic meter liquid water content (LWC) for the artificial testing and -6 C to -9 C and 0.1 to 0.5 gram per cubic meter LWC for the natural testing. Tests in the artificial icing environment behind the HISS were flown to define the nature of the HISS cloud in terms of LWC, cloud particle size and distribution; and to quantitatively determine the effects of an ice phobic coating on the capability of the UH-1H to fly in

icing conditions. The ice phobic coating did not significantly affect the capability of the UH-1H to fly in icing conditions.
GRA

N82-28290# Army Aviation Research and Development Command, St. Louis, Mo.
HISTORICAL RESEARCH AND DEVELOPMENT INFLATION INDICES FOR ARMY FIXED AND ROTOR WINGED AIRCRAFT Annual Report
Charles W. Lines, Jr. and William J. Waymire Jan. 1982 37 p refs
(AD-A114368; USAAVRADCOM-TR-82-F-3) Avail: NTIS HC A03/MF A01 CSCL 05/1

This Technical Memorandum is a continuation of previous efforts to develop the necessary rationale and methodology needed in order to construct historical inflation indices, in the Research and Development (R&D) area, relative to Army aircraft. The R&D historical indices, and the sub-indices from which they are derived, are presented in the appendices to this report for the period FY68 through FY81. These indices are appropriate for updating statistical reports that formerly utilized the OSD forecasting indices; for initial use in bringing a cost in prior years to a present-year dollar value; and for evaluating inflation actually experienced. A computer program is utilized to make the necessary mathematical calculations. Data sources for this report were the Office of Personnel Management (OPM) and the Bureau of Labor Statistics (BLS). OPM supplied data on government salaries. BLS furnished data on industry salaries and thirteen different materials. The computer program prints the R&D historical inflation indices and subindices by fiscal year as shown in Appendices C through G of this report. GRA

N82-28291# INCOSYM, Inc., Westlake Village, Calif.
LOW COST DEVELOPMENT OF INS SENSORS FOR EXPENDABLE RPV CONTROL AND NAVIGATION Final Report, Apr. 1979 - May 1981
D. G. Kim and James G. Russell Wright-Patterson AFB, Ohio AFWAL Aug. 1981 71 p
(Contract F33615-79-C-3616)
(AD-A112691; AFWAL-TR-81-3086) Avail: NTIS HC A04/MF A01 CSCL 01/3

A two year development effort has resulted in the design, fabrication and test of a feasibility model 3-axis vibrating beam accelerometer and a brassboard cycloidal magnetic vector sensor. The cycloidal magnetic vector sensor is based on a rotating coil technique which eliminates slip rings. It performed as expected, and demonstrated an accuracy of approximately 0.25 degrees. The 3-axis vibrating beam accelerometer is based on the principle that a vibrating beam will change its frequency as a function of the applied tension. Using six beams, two per sensing axis, connected to a common mass, a 3-axis accelerometer can be designed. Such a design measures acceleration, by a change in beam vibration frequency, as a function of applied acceleration to the mass. The accelerometer, at first, demonstrated an insensitivity due to frequency lock between the beams. This effect was eliminated, but the necessary change in design caused an unstable bias and non-linearity of the scale factor. A solution to these problems was also conceived, and hardware changes made. However, to fully demonstrate the concept requires a computer and software, which is outside the scope of this program.
Author (GRA)

N82-28292# Environmental Research Inst. of Michigan, Ann Arbor. Radar and Optics Div.
DESIGN STUDY FOR A LOW-DISTORTION HOLOGRAPHIC HUD Final Technical Report, Jul. 1980 - Aug. 1981
W. S. Colburn and R. C. Fairchild Wright-Patterson AFB, Ohio AFWAL Jan. 1982 104 p refs
(Contract F33615-80-C-1077)
(AD-A113982; AFWAL-TR-81-1263; ERIM-150800-29-F) Avail: NTIS HC A06/MF A01 CSCL 14/5

A low distortion holographic HUD optical system was examined. Distortion correction was based on the use of a holographic combiner made with analytically defined construction wavefronts, wavefronts for which the phase at the hologram is described by mathematical expressions. Such wavefronts are designed subsequent to the hologram design, and offer great design flexibility as their realization is based in part on the use of computer generated holograms. A method for designing the construction wavefronts of a holographic optical element based on minimizing the mean squared wavefront error while satisfying the Bragg condition is described. A holographic HUD optical system was designed for the F-16 cockpit in which distortion was corrected optically through simultaneous optimization of combiner and relay lens parameters. Both construction wavefronts of the combiner were described in terms of Legendre polynomial series. The implementation of construction beams required to form the combiner construction wavefronts is discussed. Author (GRA)

N82-28293# Federal Aviation Administration, Atlantic City, N.J.
A COMPENDIUM OF LIGHTNING EFFECTS ON FUTURE AIRCRAFT ELECTRONIC SYSTEMS Final Report
Nickolus O. Rasch Feb. 1982 257 p refs Proc. of Conf. held at Hampton, Va., 4-6 Nov. 1981
(AD-A114117; DOT-FAA-CT-82-30) Avail: NTIS HC A12/MF A01 CSCL 01/3

This publication is a composite of presentations given at the NASA-Langley Research Center/FAA Technical Center 'Lightning Effects on Future Aircraft Systems Workshop' held on November 4-6, 1981, at the NASA-Langley Research Center Facility. The presentations encompassed the full spectrum of lightning research from lightning phenomenology, lightning modeling, electromagnetic issues associated with composite materials, to the lightning/aircraft electromagnetic interaction analysis. Also included are a total of five presentations assessing the Digital System upset phenomena. Author (GRA)

N82-28294# Grumman Aerospace Corp., Bethpage, N.Y.
HYDRAULIC UNIVERSAL DISPLAY PROCESSOR SYSTEM (HUDPS) Final Report, 1 Apr. - 1 Sep. 1981
John J. Duzich and Herman L. Dreisler Warminster, Pa. Naval Air Development Center 21 Nov. 1981 66 p refs
(Contract N62269-81-C-0243)
(AD-A114428; NADC-82062-60) Avail: NTIS HC A04/MF A01 CSCL 01/3

This six month study effort explored methods of display fault indication to ground support personnel and optimize microprocession circuitry for universal aircraft application. Task I was established the maximum number of sensors required for a complex, comprehensive diagnostic system for the F14A as 150: Inputs could be either analog or digital. For comparison purposes, an AGE system was considered. Fault display methods were investigated with emphasis on smart alphanumeric devices in Task II. Volatile and non-volatile memory components were utilized along with the Intel 8748 microprocessor and associated EPROMS. The use of National Semiconductor ADC0816 data acquisition chips consisting of a 16 input multiplexer, an 8 bit A/D converter and an 8 bit tri-state buffered output facilitates the many inputs. Power consumption for a complete system was estimated as 5 watts while airborne. On the ground, 15 watts at 5 volts is required for display requirements. Display envelope would measure 8x7x6 and would contain approximately 6 circuit boards. In Task III a universal display processor system was formulated. A Block Diagram and several flow diagrams were generated. Multiplexer schematics were established for analog and discrete inputs. An electrical component parts list was generated for a typical system. Author (GRA)

N82-28295*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
STATIC NOISE TESTS ON MODIFIED AUGMENTOR WING JET STOL RESEARCH AIRCRAFT
G. R. Cook and B. F. Lilley (deHavilland Aircraft of Canada, Ltd., Downsview, Ontario) Feb. 1981 58 p refs
(NASA-TM-81231; NAS 1.15:81231) Avail: NTIS HC A04/MF A01 CSCL 21E

Noise measurements were made to determine if recent modifications made to the bifurcated jetpipe to increase engine thrust had at the same time reduced the noise level. The noise field was measured by a 6-microphone array positioned on a 30.5m (100 ft) sideline between 90 and 150 degrees from the left engine inlet. Noise levels were recorded at three flap angles over a range of engine thrust settings from flight idle to emergency power and plotted in one-third octave band spectra. Little attenuation was observed at maximum power, but significant attenuation was achieved at approach and cruise power levels.
T.M.

N82-28296*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.
B747/JT9D FLIGHT LOADS AND THEIR EFFECT ON

and Evaluation', by providing those specific additional evaluation concepts and techniques necessary for aircrew training device (ATD) test and evaluation. Volume 1 is concerned, first with describing both general and specific ATD OT/E planning and management considerations and links those events which occur early in the ATD acquisition process to later ATD OT/E planning and management activities. It defines the various evaluation concepts germane to understanding ATD OT/E, and describes the two major ATD OT/E activities--Initial/Qualification OT/E and Follow-on OT/E; matters of ATD value and worth to the Air Force. The acquisition and life cycle costs associated with modern ATDs make such concerns important. GRA

N82-29333# Calspan Field Services, Inc., Arnold Air Force Station, Tenn.

THE USE OF A MULTI-DEGREE-OF-FREEDOM DUAL BALANCE SYSTEM TO MEASURE CROSS AND CROSS-COUPLING DERIVATIVES Final Report, 1 Oct. - 1 Nov. 1981

D. R. Haberman AEDC Apr. 1982 92 p refs Sponsored by Air Force
(AD-A114813; AEDC-TR-81-34) Avail: NTIS HC A05/MF A01 CSCL 12/1

The equations of motion are derived for two existing dual balance systems used at the Arnold Engineering Development Center (AEDC) to obtain measurements of aerodynamic cross and cross-coupling derivatives. The complete equations of motion presented include the effects of sting motion. Each system incorporates a dynamic cross flexure balance and a five-component static balance. The primary deflection modes of the balances were confirmed using a holographic interferometry measurement technique. Both laboratory and wind tunnel data are presented to illustrate dynamic effects. Author (GRA)

N82-29334# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Fluid Dynamics Panel.

WINDTUNNEL CAPABILITY RELATED TO TEST SECTIONS, CRYOGENICS, AND COMPUTER-WINDTUNNEL INTEGRATION

Apr. 1982 6[illegible] p refs
(AGARD-AR-174; ISBN-92-835-1420-3) Avail: NTIS HC A04/MF A01

The roles of computational fluid dynamics and wind tunnels, and their growing interdependence are considered. Transonic test sections, cryogenic testing technology, and integration of computer and wind tunnel testing are discussed. S.L.

N82-29343# Sandia Labs., Albuquerque, N. Mex. Aerodynamic Simulation Div.

USER'S MANUAL FOR THE AMEER FLIGHT PATH-TRAJECTORY SIMULATION CODE

Eugene J. Meyer Oct. 1981 187 p refs
(Contract DEOAC04-76DP-00789)
(DE82-007004; SAND-80-2056) Avail: NTIS HC A09/MF A01

A guide to the use of the AMEER (Aero-Mechanical Equations Evaluation Routines) flight path-trajectory simulation code is presented. The input data requirements, computed output data available, code control features, and code flow logic are described for a rigid-body six-degree-of-freedom or point mass simulation. DOE

N82-29347# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).

PRELAUNCH ESTIMATES OF NEAR EARTH SATELLITE LIFETIMES USING QUASI-DYNAMIC ATMOSPHERE MODELS - APPLICATION TO A PROPOSED BRAZILIAN SATELLITE

Nellore S. Venkataraman and Kondapalli Rama Rao Feb. 1982 22 p refs Submitted for publication
(INPE-2325-PRE/080) Avail: NTIS HC A02/MF A01

A rapid prelaunch estimate of near Earth satellite lifetimes using the small perturbation theory is calculated. A quasi-dynamic atmospheric model is used employing a different exospheric temperature every three months. The drag coefficient is calculated using kinetic theory. S.L.

N82-29393# Ellis (George S.), Chardon, Ohio.

ETHANOL PRODUCTION BY VAPOR COMPRESSION DISTILLATION Final Report

George S. Ellis 1981 9 p
(Contract DE-FG02-80R5-10240)
(DE82-004892; DOE/R5-10240/2) Avail: NTIS HC A02/MF A01

It was the goal of the project to develop and demonstrate a one (1) gallon per hour vapor compression distillation unit for fuel ethanol production that could be profitably manufactured and economically operated by individual family units. The unit constructed was originally built for strictly ambient temperature operation, but later modified to permit elevated temperature operation. It successfully separated ethanol from a dilute solution, but only at a very low production rate. The initial configuration had the compressor located outside of the distillation vessel and was losing excessive energy to the environment. Therefore, it would not be possible to operate that design at elevated temperature. Thus, the compressor was moved inside the distillation vessel. DOE

N82-29464# Brookhaven National Lab., Upton, N. Y.

WATER-COMPATIBLE POLYMER CONCRETE MATERIALS FOR USE IN RAPID REPAIR SYSTEMS FOR AIRPORT RUNWAYS Final Report, Mar. 1980 - Feb. 1981

T. Sugama and L. E. Kukacka Mar. 1981 128 p refs
(Contracts AFOSR ISSA 80-00027; DE-AC02-76CH-00016; AF Proj. 2307)
(DE82-010994; BNL-51390; AFOSR-81-0589TR) Avail: NTIS HC A07/MF A01

Water-compatible polymer concrete (PC) formulations were developed which appear to have potential for use in all-weather rapid repair procedures for bomb-damaged runways. Formulations consisting of furfuryl alcohol, water-saturated aggregate, dry silica flour, promoters, and catalysts produced composites with properties suitable for repair purposes when mixed and polymerized at temperatures from -200 to 300 C. Calcium-unsaturated polyester complexed PC also produced excellent properties. However, the early strength criteria [2000 psi (13.78 MPa) at 1 h] and other requirements such as compatibility of the formulation with water and practical working times could be attained only at temperatures > 200 C. This system can be polymerized under water. Studies of the polymerization reaction mechanisms, materials properties, costs, and potential placement methods were performed. DOE

N82-29476# UOP, Inc., Des Plaines, Ill.

UNITED STATES AIR FORCE SHALE OIL TO FUELS, PHASE 2 Interim Technical Report, 1 Apr. 1979 - 30 Sep. 1980

J. R. Wilcox, J. G. Sikonia, T. G. Board, and F. J. Riedl Wright-Patterson AFB, Ohio AFWAL Nov. 1981 295 p refs
(Contract F33615-78-C-2079)
(AD-A114531; AFWAL-TR-81-2116) Avail: NTIS HC A13/MF A01 CSCL 21/4

Phase II of this project was conducted to demonstrate innovative technology to reduce the cost of converting shale oil to high yields of aviation turbine fuels. To carry out this program, UOP selected a processing scheme involving hydrocracking as the primary conversion unit. The Phase II program included pilot plant processing, fouling studies and economic analysis. The pilot plant operations performed during Phase II involved four specific processing steps: feed preparation, low pressure hydrotreating, high pressure hydrotreating, and hydrocracking. Two shale oil feedstocks were utilized for each processing step: shale oil derived from Occidental Modified In-Situ retort and shale oil obtained from the Paraho direct-heated retort. Using data generated from the pilot plant operations and the study basis provided by the USAF, economic analyses were performed to find the cost of production of jet fuel, and total liquid product at a 15% discounted cash flow rate of return (DCFRR) on investment. GRA

N82-29510*# Draper (Charles Stark) Lab., Inc., Cambridge, Mass.

SYSTEM DATA COMMUNICATION STRUCTURES FOR ACTIVE-CONTROL TRANSPORT AIRCRAFT, VOLUME 1 Final Report

A. L. Hopkins, J. H. Martin, L. D. Brock, D. G. Jensson, S. Serben, T. B. Smith, and L. D. Hanley Jun. 1981 236 p refs 2 Vol.
(Contract NAS1-15359)
(NASA-CR-165773-Vol-1; NAS 1.26:165773-Vol-1; R-1469-Vol-1) Avail: NTIS HC A11/MF A01 CSCL 17B

Candidate data communication techniques are identified, including dedicated links, local busses, broadcast busses, multiplex buses, and mesh networks. The design methodology for mesh networks is then discussed, including network topology and node architecture. Several concepts of power distribution are reviewed, including current limiting and mesh networks for power. The technology issues of packaging, transmission media, and lightning are addressed, and, finally, the analysis tools developed to aid in the communication design process are described. There are special tools to analyze the reliability and connectivity of networks and more general reliability analysis tools for all types of systems. S.L.

N82-29511*# Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
SYSTEM DATA COMMUNICATION STRUCTURES FOR ACTIVE-CONTROL TRANSPORT AIRCRAFT, VOLUME 2 Final Report
A. L. Hopkins, J. H. Martin, L. D. Brock, D. G. Jansson, S. Serben, T. B. Smith, and L. D. Hanley Jun. 1981 156 p refs 2 Vol.
(Contract NAS1-15359)
(NASA-CR-165773-Vol-2; NAS 1.26:165773-Vol-2; R-1469-Vol-2) Avail: NTIS HC A08/MF A01 CSCL 17B

The application of communication structures to advanced transport aircraft are addressed. First, a set of avionic functional requirements is established, and a baseline set of avionics equipment is defined that will meet the requirements. Three alternative configurations for this equipment are then identified that represent the evolution toward more dispersed systems. Candidate communication structures are proposed for each system configuration, and these are compared using trade off analyses; these analyses emphasize reliability but also address complexity. Multiplex buses are recognized as the likely near term choice with mesh networks being desirable for advanced, highly dispersed systems. S.L.

N82-29520# Lincoln Lab., Mass. Inst. of Tech., Lexington.
MOVING TARGET DETECTOR (MOD 2)
David Karp and John R. Anderson 3 Nov. 1981 159 p refs
(Contracts DOT-FATO-WAI-679; F19628-80-C-0002)
(AD-A114709; ATC-95; FAA-RD-80-77) Avail: NTIS HC A08/MF A01 CSCL 17/9

Under FAA sponsorship, MIT/Lincoln Laboratory has developed a second generation, field operable Moving Target Detection System (MTD-II) which has been tested at operational FAA terminal and enroute radar sites, and serves as the basis for the ASR-9 MTD technical performance specifications. This summary report covers the period October, 1976 through September, 1979 in which design, development, field testing and system performance evaluation were carried out. Report No. FAA-RD-76-190, ATC-69, 'Description and Performance Evaluation of the Moving Target Detector' dated 8 March 1977, serves as the technical foundation of this work. MTD-processing design modifications were effected to handle conditions of excessive ground clutter and moving ground traffic. The rationale for the modified algorithms is provided, and measured performance characteristics at several FAA field sites are discussed. Author (GRA)

N82-29527# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ELECTROMAGNETIC PROPAGATION PROBLEMS IN THE TACTICAL ENVIRONMENT
Apr. 1982 155 p refs Lecture Series held in Munich, 3-4 May 1982 and Paris, 6-7 May 1982
(AGARD-LS-120; ISBN-92-835-1419-X) Avail: NTIS HC A08/MF A01

Propagation criteria affecting the performance of electronic equipment under battlefield conditions are discussed. For individual titles, see N82-29528 through N82-29537.

N82-29535# Royal Aircraft Establishment, Farnborough (England).
PROPAGATION PROBLEMS ASSOCIATED WITH AIRCRAFT COMMUNICATIONS SYSTEMS
B. Burgess *In* AGARD Electromagnetic Propagation Probl. in the Tactical Environ. Apr. 1982 10 p refs (For primary document see N82-29527 20-32)
Avail: NTIS HC A08/MF A01

Communications with mobiles is assuming increasing importance in a military context, with the advances in technology enabling not only greater amounts of information to be transferred, but also fostering a much harsher electromagnetic environment. The trend towards digital communications systems coupled with the possible demand for the wider bandwidths means that the propagation medium characteristics that influence the performance of these links are somewhat different from those that need to be addressed for narrowband analogue modulation transmissions. The various types of communications systems that are used with aeromobile platforms are reviewed and the various propagation problems that arise in achieving systems with good overall performance discussed. The links are conveniently divided into two types: beyond line of sight and line of sight systems, and span the frequency range from LF through to microwaves. Author

N82-29655# Syracuse Univ., N. Y. Dept. of Physics.
COMPUTER ENHANCED ANALYSIS OF A JET IN A CROSS-STREAM
John W. Trischka and Nancy J. Birkenheuer (Midwest Research Inst., Golden, Colo.) 22 Feb. 1982 41 p refs Backup document for AIAA synoptic scheduled for publication in the AIAA Journal, Feb. 1983
Avail: NTIS HC A03/MF A01

Previously analyzed velocity data for a jet in a wind tunnel cross stream was used in a computer analysis which, through interpolation and extrapolation, produced velocity and vorticity fields on a uniform, three dimensional grid. Microfilm output from the computer displayed isopleths on sets of planes in three orthogonal directions. Improved determinations were made of the jet center line, of the center lines of the bound vortices and of the jet boundaries. Stationary waves were discovered in the mixing region on the upstream side of the jet. An explanation for these waves is proposed. The angle between vorticity and velocity is used to compare the flow with complex lamellar and Beltrami flows. A convergence feature in the jet wake is noted. Author

N82-29656*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CORRELATION OF PRESTON-TUBE DATA WITH LAMINAR SKIN FRICTION (LOG NO. J12984)
T. D. Reed (Oklahoma State Univ., Stillwater), A. Abu-Mostafa (Oklahoma State Univ., Stillwater), and F. W. Steinle, Jr. 18 Jan. 1982 37 p refs Backup document for AIAA Synoptic scheduled for publication in AIAA Journal in Feb. 1983
(Grants NSG-2396; NAG2-78)
(NASA-TM-84827; NAS 1.15:84827; Log-J12984) Avail: NTIS HC A03/MF A01 CSCL 20D

Preston tube data within laminar boundary layers obtained on a sharp ten-degree cone in the NASA Ames eleven-foot transonic wind tunnel are correlated with the corresponding values of theoretical skin friction. Data were obtained over a Mach number range of 0.30 to 0.95 and unit Reynolds numbers of 9.84, 13.1, and 16.4 million per meter. The rms scatter of skin friction coefficient about the correlation is of the order of one percent, which is comparable to the reported accuracy for calibrations of Preston tubes in incompressible pipe flows. In contrast to previous works on Preston tube/skin friction correlations, which are based on the physical height of the probe's face, this satisfactory correlation for compressible boundary layer flows is achieved by accounting for the effects of a variable 'effective' height of the probe. The coefficients, which appear in the correlation, are dependent on the particular tunnel environment. The general procedure can be used to define correlations for other wind tunnels. Author

N82-29660# Electro Magnetic Applications, Inc., Denver, Colo.
ATMOSPHERIC ELECTRICITY HAZARDS ANALYTICAL MODEL DEVELOPMENT AND APPLICATION. VOLUME 1: LIGHTNING ENVIRONMENT MODELING Final Report, Aug. 1979 - Jun. 1982
Martin A. Uman (Lightning Location and Protection, Inc.) and E. Philip Krider (Lightning Location and Protection, Inc.) Wright-Patterson AFB, Ohio AFWAL Aug. 1981 172 p refs 3 Vol.
(Contract F33615-79-C-3412; AF Proj. 2402)
(AD-A114015; EMA-81-R-21-Vol-1; AFWAL-TR-81-3084-Vol-1) Avail: NTIS HC A08/MF A01 CSCL 04/1

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FLIGHT TEST VEHICLES
A unique flight test facility - Description and
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[AIAA 82-1606] A82-38986
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[AD-A112683] N82-28464
Ethanol production by vapor compression distillation
[DE82-004892] N82-29393
United States Air Force shale oil to fuels, phase 2
[AD-A114531] N82-29476

A82-40483 † **Sport aircraft (Sportivnye samolety).** S. A. Iakovlev. Moscow, Izdatel'stvo DOSAAF SSSR, 1981. 72 p. In Russian.

The development and character of sport aviation in the Soviet Union are discussed, with attention given to the historical background and the line of Yak light aircraft. Non-Soviet sport aircraft are also considered. Many color drawings of sport aircraft are presented. B.J.

A82-40505 **American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings.** Washington, DC, American Helicopter Society, 1982. 537 p. (For individual items see A82-40506 to A82-40556)

Among the topics discussed are the aerodynamics, structural dynamics, propulsion, design, avionics, product assurance, structures and materials, testing, and acoustics of helicopters. The papers presented cover optimum airloads of rotors in hover and forward flight, the evaluation of vertical drag and ground effect, helicopter vibration reduction by rotor blade modal shaping, the finite element analysis of bearingless rotor blade aeroelasticity, adaptive fuel controls, digital full authority engine controls, helicopter autorotation assist concepts, and the conceptual design of an integrated cockpit. Also presented are papers on the demonstration of radar reflector detection, avionics systems for helicopter integration, the adaptation of pultrusion to the manufacture of helicopter components, composite main rotor blades, optimum structural design, the in-plane shear testing of thin panels, error minimization in ground vibration testing, and the prediction of helicopter rotor discrete frequency noise. O.C.

A82-40506 # **Theory and application of optimum airloads to rotors in hover and forward flight.** R. C. Moffitt and J. R. Bissell (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 1-12. (For individual items see A82-40506 to A82-40556)

A method is derived and applied that predicts optimum lift distribution for rotors in hover and forward flight. A key feature of the method is that it is formulated in terms of a matrix equation that gives a direct solution when wake geometry is fixed. An evaluation of the Theodorsen optimum static propeller theory, conducted with the analysis, indicates that the theory is not rigorous. It is shown that the torque differential term omitted in that analysis is both finite and significant. With this term included, the optimum static propeller wake displacement velocity is not constant. An optimized Black Hawk twist distribution in hover is shown to closely approximate the classic inverse radius pitch distribution predicted by strip momentum theory. The resulting downwash, however, is constant only over the inner 75% of the radius and substantial reductions occur in the tip region. Predicted improvements in Black Hawk forward flight performance with optimized azimuthally varying twist are significant but the associated variable twist is complex. (Author)

A82-40507 # **A new Transonic Airfoil Design Method and its application to helicopter rotor airfoil design.** J. C. Narramore and J. G. Yen (Bell Helicopter Textron, Fort Worth, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 13-23. 28 refs.

A new Transonic Airfoil Design Method has recently been developed which can produce airfoils with desired aerodynamic, dynamic, and geometric characteristics. This new method is based on fundamental principles and utilizes efficient techniques to provide a practical airfoil design tool. Compressibility and shock wave terms are included in the method which evaluates families of velocity distributions and selects the best one which will satisfy the design objectives. This pressure distribution is used as input to a transonic inverse routine which calculates the coordinates of the section that will produce the desired velocity. Using this approach, sections can be produced that will provide desired levels of lift, drag, and pitching moment at the design operating conditions. This technology is applied to the design of an aeroelastically compliant rotor (ACR) by designing airfoils which produce favorable pitching moment and performance at design Mach number and Reynolds number conditions. (Author)

A82-40508 # **Recent advances in rotor technology at Boeing Vertol.** M. A. McVeigh and F. J. McHugh (Boeing Vertol Co., Philadelphia, PA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 24-33.

Results of a wind tunnel test on advanced rotor configurations present an assessment of the benefits of advanced airfoils, tip shape, blade chord, and blade number. A CH-47D model rotor with VR-7/8 airfoils was tested as a reference rotor. The advanced rotors, incorporating recently-developed VR-12/15 high speed airfoils, were tested to 231 knots in the wind tunnel and demonstrated an improvement of 6.0% in figure of merit and 25% in cruise lift-to-effective-drag ratio over a rotor with VR-7/8 airfoils. The advanced airfoils show significant improvements in stall inception limits, flying qualities boundaries and rotor noise. Improved blade tip shapes provide additional benefits in rotor noise and do not reduce the stall inception boundary. (Author)

A82-40509 * # **Evaluation of an asymptotic method for helicopter rotor airloads.** A. R. Vaidyanathan and G. A. Pierce (Georgia Institute of Technology, Atlanta, GA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 34-42. 21 refs. Contracts No. NAS1-16222; No. NAS1-16817.
(Previously announced in STAR as N82-21156)

A82-40510 * # **An evaluation of vertical drag and ground effect using the RSRA rotor balance system.** R. J. Flemming (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT) and R. E. Erickson (NASA, Ames Research Center, Moffett Field, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 43-54. 12 refs.

A flight test program utilizing the Rotor Systems Research Aircraft (RSRA) main rotor balance system was conducted to obtain data for the helicopter configuration. The test program is discussed along with the employed data reduction methods, and the results. NASA 740, the RSRA used for the vertical drag test, was in the standard helicopter configuration. The 31-foot radius blades have a linear twist of eight degrees and NACA 0012 airfoil sections. Aspects of instrumentation are considered, taking into account the data recording system, the static calibration facility, and aspects of data calibration and processing. Attention is given to the test procedure, data analysis methods, balance measurements, the ground effect, and vertical drag. It is found that the RSRA rotor balance system is capable of providing high quality performance data. The vertical drag of the RSRA is 4%, compared to 2.9% predicted. G.R.

A82-40511 * # **Effect of tip vanes on the performance and flow field of a rotor in hover.** H. R. Velkoff and T. W. Parker (Ohio State University, Columbus, OH). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 55-64. 7 refs. NASA-sponsored research.

Tests run with a single bladed model rotor with a vane located at the tip of the blade indicated significantly increased performance under certain test conditions. Data reveal that a figure of merit increase of over one third occurred in hover. Flow visualization using smoke revealed that a pair of vortices sprung from the blade tip and the vane tip. The vane tip vortex tended to roll up and over the primary vortex. The vortices in the wake became much less well defined with the tip vane configurations. (Author)

A82-40512 # **An experimental investigation of a bearingless model rotor in hover.** S. Dawson (U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 65-79. 6 refs.

A 1.79-m diameter model rotor was used to investigate the aeroelastic stability of an isolated bearingless rotor blade in hover, and the results were compared with theory. Configurations tested included (1) an uncoupled configuration with a leading and trailing edge pitch link; (2) a cantilever pitch arm configuration with a single pitch link on the trailing edge of the blade (three pitch link radial locations were studied); (3) a cantilever pitch arm configuration with a single trailing edge pitch link (again three radial locations were studied); (4) a trailing edge pitch link location with -2.5 deg droop; and (5) a trailing edge pitch link location with 2.5 deg precone. Lead-lag damping was heavily dependent on pitch link radial location at higher pitch angles for the cantilever pitch arm configurations studied. Theoretical predictions show stability trends quite well in almost all cases but show discernible differences in damping at higher pitch angles. (Author)

A82-40513 # **Whirl mode stability of the main rotor of the YAH-64 Advanced Attack Helicopter.** L. J. Silverthorn (Hughes Helicopters, Inc., Culver City, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 80-89.

The selection of the main rotor configuration for the YAH-64 helicopter was based on the very favorable experience with the combat-proven rotor system of the OH-6A Light Observation Helicopter. Results of an analysis conducted to investigate the main rotor cyclic modes have shown an instability at the advancing whirl mode frequency of 15 hertz. The whirl mode instability was eliminated in connection with design changes. It is pointed out that the whirl mode instability is an aeroelastic phenomenon strongly dependent on coupling between hub motion and blade pitch change motion. Rotor support structure stiffening proved to be effective in increasing whirl model stability boundaries. G.R.

A82-40514 # **Helicopter vibration reduction by rotor blade modal shaping.** R. B. Taylor (United Technologies Research Center, East Hartford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 90-101.

The general vibration design criteria currently used in helicopter rotor blade design is placement of natural frequencies removed from integer frequencies of rotor rotation. In this paper, a theoretical approach is presented which demonstrates that design consideration of blade mode shapes can be as important as consideration of natural frequencies for vibration transmitted to the helicopter fuselage. A Modal Shaping Parameter is derived from the theoretical approach that is a measure of blade modal vibration susceptibility. A baseline blade design is then revised in accordance with minimizing the value of the Modal Shaping Parameter. A comparison of hub vibration predicted by a fully coupled aeroelastic analysis for the baseline and revised blade design shows a 70 percent reduction in the contribution of the flatwise modes to vertical hub vibration as well as a 20-30 percent reduction in blade fatigue loading. It is demonstrated that the large reductions in vibration resulted directly from desensitizing certain blade modes to aerodynamic loading as predicted by the modal shaping approach. (Author)

A82-40515 # Correlation of predicted vibrations and test data for a wind tunnel helicopter model. R. Sopher and S. B. R. Kottapalli (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 102-113. 9 refs.

The desirability to reduce helicopter vibrations has motivated the development of a substructure vibration analysis. The computer program involved is designed to serve as a predictive and design tool for designing helicopters for low vibrations. The substructure analysis, (SIMVIB - Simplified Vibration Analysis) embodies features which are necessary for vibration prediction. Little is known about the validity and sensitivity of the conducted analysis. A description is presented of the results of a limited correlation study performed at model scale to examine the method. The correlations of fuselage vibrations and blade moments are presented and discussed. Sensitivities of analytical predictions to changes in dynamic properties of the fuselage are shown. In addition, a study is conducted of the correlation of analysis and theory when higher harmonic control is applied to the rotor to minimize fuselage vibrations. G.R.

A82-40516 # Wind tunnel modeling of rotor vibratory loads. R. Gabel, M. Sheffler, F. Tarzanin, and D. Hodder (Boeing Vertol Co., Philadelphia, PA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 114-124.

A tandem rotor dynamic model has been designed, manufactured and tested at the Boeing Vertol 20 x 20 ft. V/STOL Wind Tunnel. The model measures vibratory hub loads with five independent measuring systems on each rotor. This four-bladed model was flown at full scale tip speeds through a wide envelope of airspeeds and thrusts, achieving a maximum speed of 200 knots. The various measurement systems are discussed, calibration activities are reviewed and test results are presented. (Author)

A82-40517 * # Finite element analysis for bearingless rotor blade aeroelasticity. N. T. Sivaneri and I. Chopra (NASA; Stanford Joint Institute for Aeronautics and Acoustics, Stanford, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 125-139. 18 refs. Grant No. NCC2-13.

A conventional articulated rotor blade has mechanical flap and lag hinges, a lag damper, and a pitch bearing. In connection with an interest in designs of greater mechanical simplicity and increased maintainability, hingeless and bearingless rotors have been developed. A hingeless blade lacks the hinges and is cantilevered at the hub. It does have a pitch bearing for pitch control. A bearingless design eliminates the hinges and the pitch bearing as well. In the present investigation of bearingless rotor blade characteristics, finite element analysis has been successfully applied to determine the solutions of the nonlinear trim equations and the linearized flutter equations of multiple-load-path blades. The employed formulation is based on Hamilton's principle. The spatial dependence of the equations of motion is discretized by dividing the flexbeams, the torque tube, and the outboard into a number of elements. G.R.

A82-40518 * # Civil helicopter propulsion system reliability and engine monitoring technology assessments. J. A. Murphy (Bell Helicopter Textron, Fort Worth, TX) and J. Zuk (NASA, Ames Research Center, Moffett Field, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 140-149. 16 refs. NASA-supported research.

A study to reduce operating costs of helicopters, particularly directed at the maintenance of the propulsion subsystem, is presented. The tasks of the study consisted of problem definition refinement, technology solutions, diagnostic system concepts, and emergency power augmentation. Quantifiable benefits (reduced fuel consumption, on-condition engine maintenance, extended drive system overhaul periods, and longer oil change intervals) would increase the initial cost by $43,000, but the benefit of $24.46 per hour would result in breakeven at 1758 hours. Other benefits not capable of being quantified but perhaps more important include improved aircraft availability due to reduced maintenance time, potential for increased operating limits due to continuous automatic monitoring of gages, and less time and fuel required to make engine power checks. The most important improvement is the on-condition maintenance program, which will require the development of algorithms, equipment, and procedures compatible with all operating environments. R.K.R.

A82-40519 # Adaptive fuel control feasibility investigation. R. L. Bolton (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 150-155.

Responsive, stable power control has been an important design objective since the advent of the helicopter. Many helicopters flying today, however, suffer from less than desirable power response because of the difficulty in designing a system which is rapid in rotor speed control over the entire operating envelope. An optimization regarding the response of engine power for all flight regimes would be particularly important in the case of a combat helicopter. A description is presented of an on-going program of investigation of adaptive fuel control concepts utilizing existing full authority electronic systems capability. The concepts developed in this program are being analyzed by use of a full dynamic computer simulation of the engine/fuel control/airframe. It was found that fuel consumption can be reduced as much as 10% by variation of rotor speed for very specific cruise conditions, i.e., high speed, high altitude, and heavy load. G.R.

A82-40520 # 800 Shaft Horsepower Advanced Technology Demonstrator Engine (ATDE) status update. D. B. Cale (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 156-162.

The objectives, engine design features, accomplishments and current status of the ATDE program are presented. More than 1000 hours of engine and gas generator testing have been accumulated, including performance, environmental and durability testing, and objectives are being demonstrated and problems discovered. More than 1500 hours of aerodynamic component testing and 4000 hours of fuel system and mechanical component testing have also been done. In particular, the durability demonstration was considered successful, but certain redesign efforts, such as inlet separator performance and producibility, compressor durability, and bearing durability, are necessary and are being considered. R.K.R.

A82-40521 * # TF34 Convertible Engine System Technology Program. K. L. Abdalla (NASA, Lewis Research Center, Cleveland, OH) and A. Brooks (General Electric Co., Lynn, MA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 163-165. 8 refs.

The ability of the helicopter to function efficiently at zero flight speed is counterbalanced by a limitation to rather low forward flight speeds. An ability to fly efficiently at high speed would provide very significant improvements in rotorcraft productivity and economics. The implementation of such improvements would require the development of a suitable integrated power plant for both the vertical and horizontal flight modes. The engine should be a shaft output engine in the vertical flight mode. In the horizontal mode, the propulsor can be fan or propeller. A description is presented of a program concerned with the demonstration of a convertible turbofan/turboshaft engine. The program is nominally directed toward the demonstration of a propulsion system for an X-wing aircraft. However, the principles being investigated are applicable to any convertible turbofan/turboshaft engine application. At the current early stage of the program, no barrier problems have become apparent, and interesting possibilities for high speed rotorcraft flight are envisaged. G.R.

A82-40522 # Digital full authority controls for helicopter engines. E. S. Eccles (Dowty and Smiths Industries Controls, Ltd., Cheltenham, Glos., England). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 170-180. 5 refs. Research supported by the Ministry of Defence /Procurement Executive/.

The paper reviews the benefits that accrue to the aircraft, the operator and the crew from using full authority digital electronic engine controls. They are discussed as performance benefits, mission effectiveness benefits, cost benefits and maintainability benefits. The paper discusses the use of redundancy and its effects on the operation of aircraft, particularly commercial operation. The paper concludes that digital controls, and particularly dual redundant controls offer some very significant cost benefits to many helicopter operators. (Author)

A82-40523 # Tandem rotor helicopter characteristics in a continuous icing environment. P. J. Dunford (Boeing Vertol Co., Philadelphia, PA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 181-193. 9 refs.

nozzle exhaust, a single stage, wide chord clapperless fan, and three-dimensional core compressor and core turbine designs. Attention is given to the basic research conducted on component efficiency, which involved the use of laser holography and laser anemometry techniques for observing and measuring aerodynamic flow. O.C.

A82-40965 # Turboprop design - Now and the future. B. S. Gatzen (United Technologies Corp., Hamilton Standard Div., Windsor Locks, CT). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 879-903. 92 refs.

After an account of the development history of turboprop rotor technology during the 1960s for V/STOL applications, the development status and design and performance characteristics of commuter aircraft turboprop and high speed propeller fan rotor technologies are considered. The commuter aircraft propeller family incorporates composite shell and aluminum spar blades with a double-acting pitch change system and a pitch-lock feature, resulting in weight reduction, greater safety, improved durability, and a near-ideal aerodynamic performance in the Mach 0.4-0.65 range that assures low cabin noise levels and meets far field noise certification requirements. The propeller fan incorporates 8-10 blades with swept blade tips for the Mach 0.65-0.8 range cruise speeds of 80-160 passenger transports and military cargo and ASW aircraft. The propeller fan will result in fuel consumption reductions of 20% and 40% for commercial and military aircraft, respectively. O.C.

A82-40966 # Inflated wings. A. Roselli. In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 904-910.

The design principles and possible uses of both statically and dynamically inflated wings are considered, on the basis of their inherently high strength/weight ratios, economy of construction, and ease of storage and deployment. It is noted that the upper surface of a large statically inflated wing acts as a greenhouse-effect solar trap which may be harnessed to provide both static buoyancy, as in a hot air balloon, and energy for propulsion. Attractive uses of these large, kite-like wings include auxiliary power for ships, seed, fertilizer and insecticide-spraying platforms for agriculture, and military parachutes. O.C.

A82-40967 # Design and tests of airfoils for sailplanes with an application to the ASW-19B. L. M. M. Boermans and H. J. W. Selen (Delft, Technische Hogeschool, Delft, Netherlands). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 911-921. 14 refs.

The paper describes the considerations, tests and results of an investigation aimed at designing some improved airfoils for sailplane applications. The following preliminary studies are discussed. Windtunnel experiments on two actual wing segments of a Standard Class sailplane ASW-19B are described. The characteristics of some modern airfoils for sailplanes are analyzed. Results of flight and windtunnel experiments with respect to leading edge contamination by insects are presented. The effectiveness of pneumatic turbulators, applied to decrease the airfoil drag by avoiding laminar separation bubbles, is demonstrated. Based on the experience gained in these studies, some airfoils were designed and, after windtunnel verification, applied to the wing of an ASW-19B. Flight performance measurements before and after the wing modification showed an improvement of 5% in glide ratio over the entire practical flight speed range. (Author)

A82-40968 # Variable geometry aerofoils as applied to the Beatty B-5 and B-6 sailplanes. R. A. Streather (Atlas Aircraft Corp., Johannesburg, Republic of South Africa). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 922-930. 11 refs.

Two variable-geometry aerofoils using flexible surfaces have been developed by Beatty for his B-5 and B-6 sailplanes. The B-5 has a basic Eppler 1001 section with a flexible upper surface which is raised to form a thick, high-camber profile for thermalling. The B-6 uses a Wortman FX 05-H-126 section with flexible upper and lower surfaces over the rear 40% of the chord. Predictions for the polars of the two sections using the Eppler and NASA viscous, two-dimensional computer programs are presented. Predictions for the overall aircraft polars are compared with flight-test measurements obtained by conventional methods and by using a prototype glide-angle indicator. (Author)

A82-40969 # Development of the Circulation Control Wing-Upper Surface Blowing powered-lift system for STOL aircraft. M. J. Harris, J. H. Nichols, Jr., R. J. Englar, and G. G. Huson (David W. Taylor Naval Ship Research and Development Center, Bethesda, MD). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 931-939. 10 refs.

The design characteristics and performance levels attained in static, wind tunnel and test aircraft operation of the Circulation Control Wing/Upper Surface Blowing (CCW/USB) powered lift system for STOL aircraft are described. The configuration of the system places turbofan engine exhausts above the upper surface of a Coanda-effect trailing edge circulation-control wing, so that the exhaust gases scrub the wing upper surface. In addition to controlling effective wing camber with circulation control blowing, propulsion-induced lift is generated through the downward deflection of turbofan exhaust over the trailing edge of the wing to a degree which is controlled pneumatically by the momentum of the circulation-control jet sheet. It is experimentally demonstrated that the mechanically simple CCW/USB pneumatic system can generate high lift as effectively as the heavier and more complex mechanical flap systems. O.C.

A82-40970 # Ejector powered propulsion and high lift subsonic wing. R. A. Squyers, J. L. Porter (Vought Advanced Technology Center, Dallas, TX), K. S. Nagaraja (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH), and G. F. Cudahy (Fairchild Republic Co., Farmingdale, NY). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 940-950. 8 refs. Contract No. F33615-79-C-3017.

A high performance ejector wing is designed by means of methodologies based on three-dimensional vortex lattice and lifting line theories and two-dimensional analog techniques, in conjunction with viscous flow predictions and empirically based ejector augmentor design and performance procedures. The initial analytical consideration of various ejector wing configurations established the superior lift and thrust performance at high angles of attack of a configuration consisting of a constant pressure mixing ejector with a wing lower surface inlet and an upper wing trailing edge exhaust flow. Test results for a swept planform, four-ejector bay wing configuration indicate maximum lift/drag ratio improvements over a conventional wing of up to 27%, and an angle of attack increase of more than 10 deg without stall. A thrust augmentation factor of 1.06 was achieved at a freestream Mach number of 0.294, in keeping with predictions. O.C.

A82-40971 # Development of an advanced no-moving-parts high-lift airfoil. R. J. Englar (David W. Taylor Naval Ship Research and Development Center, Bethesda, MD). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 951-959. 15 refs.

An advanced Circulation Control Wing (CCW) airfoil has been developed by incorporating a very small radius blown trailing edge into the aft profile of an existing supercritical airfoil. This combined no-moving-parts configuration generates the same high lift as the already flight-proven large-radius CCW airfoils (section lift coefficient near 7), yet produces negligible unblown drag penalty due to leaving the device deployed for cruise flight. The large leading edge radius of the supercritical airfoil allows high-lift operation without mechanical deflection. Experimental results presented by the paper imply the feasibility of an efficient mono-element cruise and high-lift airfoil, with transition between the two modes accomplished by merely initiating blowing from the fixed trailing edge slot. Comparisons to existing blown and unblown high lift systems are made, and possible applications are discussed. (Author)

A82-40972 # Design integration of CCW/USB for a sea-based aircraft. H. S. D. Yang (Lockheed-California Co., Burbank, CA) and J. H. Nichols, Jr. (David W. Taylor Naval Ship Research and Development Center, Bethesda, MD). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 960-968. 8 refs.

A design study is being conducted to apply the technologies of Circulation Control Wing with Upper Surface Blowing (CCW/USB) engine installation to a Navy/Lockheed sea based aircraft. Research and development in the CCW and USB concepts indicate that the application of the combined technologies may achieve a goal of operating the S-3 type aircraft from a ship deck without the catapult. The design emphasizes the integration of the propulsion system with a simple installation to obtain high lift or drag when required. Attention is also being directed to the cruise efficiency and the optimum design approach for stability and control. (Author)

A82-40973 # Aircraft design for fuel efficiency. L. O. Lehman, D. Woll, and C. Lampart (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 969-979. 6 refs.

U.S. Navy Aircraft Energy Conservation Research, Development, Test and

Evaluation Program recommendations to date are presented, with emphasis on those aircraft design approaches which promise the greatest fuel savings for a given level of investment. In addition to design modifications which reduce aerodynamic drag or aircraft weight, attention is given to efficiency-enhancing propulsion system concepts, Flight Performance Advisory/Management Systems which improve mission fuel utilization, and mission planning and training techniques which improve operational effectiveness. The study results cover fighter, attack and patrol aircraft, and includes recommendations for such year 2000 air vehicles as nuclear aircraft and advanced lighter-than-air vehicles. O.C.

A82-40974 * # **Performance characteristics of a buoyant quad-rotor research aircraft.** B. L. Nagabhushan, P. P. Jacobs, C. E. Belknap (Goodyear Aerospace Corp., Defense Systems Div., Akron, OH), and D. A. Euler (Hughes Helicopters, Inc., Commercial Engineering Div., Culver City, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 980-989. Contract No. NAS2-10777.

Performance characteristics of a buoyant, quadrotor research aircraft, which represents a hybrid airship concept for heavy lift application, are described. Ceiling altitude and endurance for hovering at typical power levels, including partial power failure, are predicted. Climb performance at various altitude and gross weight conditions have been examined. Forward flight performance of this vehicle is illustrated in terms of typical performance parameters such as maximum speed, maximum range, and endurance, over the full range of its payload capability. Optimum payload weights have been identified which result in maximum range at sea level density altitude and constant endurance at various altitudes, both during hover and cruise flights. (Author)

A82-40975 # **Application of a new hybrid material /ARALL/ in aircraft structures.** J. W. Gunnink, L. B. Vogelesang, and J. Schijve (Delft, Technische Hogeschool, Delft, Netherlands). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 990-1000. 18 refs.

An aircraft structural material produced by the bonding of thin aluminum alloy sheets with an aramid fiber-reinforced adhesive, designated Aramid-Reinforced Aluminum Laminate (ARALL), is described. ARALL exhibits superior fatigue crack growth properties, and has a high tensile strength which may be maximized through the introduction of suitable residual stresses into laminates having optimized aluminum sheet thicknesses. Monolithic material test results are used as reference in comparative tensile strength and fatigue tests for notched and centrally cracked ARALL specimens, bolted and riveted joints, and lugs. Buckling test results are compared with calculations for both aluminum alloy and ARALL compression panels. Attention is given to the weight savings obtainable in pressurized cabins representative of various existing aircraft through the use of ARALL. O.C.

A82-40976 # **The behavior of composite thin-walled structures in dynamic buckling under impact.** J. Ari-Gur, J. Singer (Technion-Israel Institute of Technology, Haifa, Israel), and H. Röhrle (Dornier GmbH, Friedrichshafen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1001-1010. 12 refs.

The influence of material properties, and in particular those of composites, on response and behavior of columns under axial impact is studied. An extensive experimental investigation has been carried out on specimens made of graphite/epoxy, glass/epoxy and Kevlar/epoxy laminates with different layups. Dynamic buckling and failure are compared with those of metal columns and the relative advantages and disadvantages of the composite materials are discussed. In general, composite columns show improved dynamic buckling properties, and, with several exceptions, they may replace metal ones efficiently and reliably. (Author)

A82-40977 # **Nondestructive testing in aircraft construction using holographic methods.** K. Wanders (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Cologne, West Germany) and H. Steinbichler (Laboratory Dr. H. Steinbichler, Endorf, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1011-1017. 10 refs.

The application of high power laser-based holographic interferometry to aircraft structure nondestructive testing is described. The techniques covered include real time holography, which denotes structural deformation through the dark bands of destructive interference, the double exposure method, in which structural stresses applied between exposures are manifested as interference fringes among odd multiples of one-half wavelength, and time-average holography, which reconstructs wavefront interference between two virtual images of a vibrating structure. The concrete examples given are of a glass fiber-reinforced plastic tube, a helicopter rotor blade, the running surface of a tire, a turbine rotor, and a thermally deformed antenna, as well as exhaust nozzle jets. O.C.

A82-40978 # **Design and fabrication of cocured composite hat-stiffened panels.** G. D. Peddie and E. E. Spier (General Dynamics Corp., Convair Div., San Diego, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1018-1031. 7 refs.

Design/analysis study established cocured graphite-epoxy hat-stiffened panels of high compressive structural integrity for development and demonstration by mechanized methods. Both flat and curved-crown hats were involved in the design/analysis study, but only the flat-crown concept was included in the manufacturing study. It was found that manufacture of the curved-crown hat would not result in added complexity. Post-buckling structural integrity was assumed to be directly related to the summation of classical local bifurcation buckling strengths of panel elements. Parts were built in stages with the final panel being 18 feet long. Mechanization and tooling procedures were proven to be valid for the manufacturyof long panels. Test panels were not fabricated in time for correlation with analysis, but testing will be performed in the near future. (Author)

A82-40979 # **Spin behaviour of the Pilatus PC-7 Turbo Trainer.** P. Wittwer and O. Masefield (Pilatus Flugzeugwerke AG, Stans, Switzerland). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1032-1039.

Experience gained during the development of the PC-7 Turbo Trainer aircraft suggests that while spin tunnel tests are helpful in determining the critical points of a design's spin characteristics, an exhaustive and accurate forecast of spin behavior is not attainable. The spin tunnel test model used for the PC-7 had a generally steeper nose-down attitude, and was faster turning, than the prototype aircraft. Recovery turns were, however, accurately represented. Attention is given to the differences in spin behavior resulting from a series of modifications to the prototype aircraft in the course of its spin test program. O.C.

A82-40982 # **Models for the motor state of VSCF aircraft electrical power system.** X. Qiu, Y. Yan, and Y. Hu (Nanjing Aeronautical Institute, Nanjing, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1061-1071.

Mathematical models for the motor state of an AC-AC variable speed constant frequency (VSCF) power system are established in this paper. Two computing methods, of which the first is a method for finding the analytic solution of the state transition matrix with a computer and the second is a combination of the 0.618-optimization method and the Runge-Kutta method, are proposed. These methods reduce computation time. (Author)

A82-40983 # **The effect of intake flow disturbances on APU compressor blade high cycle fatigue in the Airbus A300.** K. W. Lotter and J. Jörg (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1072-1081. 7 refs.

Premature compressor failures of the APU in the Airbus A300, related to high cycle fatigue, led to a detailed investigation of the relevant intake/engine parameters. Relatively high total pressure distortion and excessive flow angularity have been determined to be the cause of high alternating blade loads and, in combination with the chosen material of the compressor disk and blades, surface fretting. In systematic test steps intake modifications were developed to improve the intake flow quality. It is shown that only relatively minor intake modifications were required to achieve a substantial improvement in total pressure distortion and swirl. In addition, a suitable modification at the compressor blade dove-tails was initiated to increase the blades' fatigue strength. (Author)

A82-40984 # **Engine controls for the 1980s and 1990s.** V. A. Fisher (Rolls-Royce, Ltd., Bristol, England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1082-1087.

After a brief developmental history of full-authority electronic engine control systems, with attention to that employed by the Olympus 593 engines of the Concorde SST, consideration is given to the developmental prospects for such systems in the near future in view of the increasing power of microprocessors.

ENGINE RUNNING CLEARANCES AND PERFORMANCE DETERIORATION; BCAC NAIL/P AND WA JT9D ENGINE DIAGNOSTICS PROGRAMS
W. J. Olsson and R. L. Martin 19 Feb. 1982 74 p refs
Prepared in cooperation with Boeing Commercial Airplane Co., Seattle
(Contracts NAS3-20632; NAS1-15325)
(NASA-CR-165573; NAS 1.26:165573; PWA-5512-88) Avail: NTIS HC A04/MF A01 CSCL 21E

Flight loads on the 747 propulsion system and resulting JT9D blade to outer airseal running clearances during representative acceptance flight and revenue flight sequences were measured. The resulting rub induced clearance changes, and engine performance changes were then analyzed to validate and refine the JT9D-7A short term performance deterioration model.
Author

N82-28297*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
CF6 JET ENGINE PERFORMANCE IMPROVEMENT: HIGH PRESSURE TURBINE ACTIVE CLEARANCE CONTROL
S. E. Rich and W. A. Fasching Jun. 1982 136 p refs
(Contract NAS3-20629)
(NASA-CR-165556; NAS 1.26:165556; R82AEB198) Avail: NTIS HC A07/MF A01 CSCL 21E

An active clearance control system was developed which reduces fuel consumption and performance degradation. This system utilizes compressor discharge air during takeoff and fan discharge air during cruise to impinge on the shroud structure to improve the thermal response. The system was evaluated in component and engine tests. The test results demonstrated a performance improvement of 0.7 percent in cruise SFC. S.L.

N82-28298*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
ANALYTICAL AND SIMULATOR STUDY OF ADVANCED TRANSPORT Final Report
William H. Levison and William W. Rickard (Douglas Aircraft Co., Long Beach, Calif.) Washington NASA Jun. 1982 86 p refs
(Contract NAS1-16410)
(NASA-CR-3572; NAS 1.26:3572; Rept-4778) Avail: NTIS HC A05/MF A01 CSCL 01C

An analytic methodology, based on the optimal-control pilot model, was demonstrated for assessing longitudinal-axis handling qualities of transport aircraft in final approach. Calibration of the methodology is largely in terms of closed-loop performance requirements, rather than specific vehicle response characteristics, and is based on a combination of published criteria, pilot preferences, physical limitations, and engineering judgment. Six longitudinal-axis approach configurations were studied covering a range of handling qualities problems, including the presence of flexible aircraft modes. The analytical procedure was used to obtain predictions of Cooper-Harper ratings, a solar quadratic performance index, and rms excursions of important system variables.
T.M.

N82-28299*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METHODOLOGY FOR DETERMINING ELEVON DEFLECTIONS TO TRIM AND MANEUVER THE DAST VEHICLE WITH NEGATIVE STATIC MARGIN
Boyd Perry, III May 1982 50 p refs
(NASA-TM-84499; NAS 1.15:84499) Avail: NTIS HC A03/MF A01 CSCL 01C

The relationships between elevon deflection and static margin using elements from static and dynamic stability and control and from classical control theory are emphasized. Expressions are derived and presented for calculating elevon deflections required to trim the vehicle in 1g straight-and-level flight and to perform specified longitudinal and lateral maneuvers. Applications of this methodology are made at several flight conditions for the ARW-2 wing. On the basis of these applications, it appears possible to trim and maneuver the vehicle with the existing elevons at -15% static margin.
Author

N82-28301# Virginia Univ., Charlottesville. Dept of Mechanical and Aerospace Engineering.
LIMITING PERFORMANCE OF NONLINEAR SYSTEMS WITH APPLICATIONS TO HELICOPTER VIBRATION CONTROL PROBLEMS Final Report
Walter D. Pilkey 1982 26 p refs
(Grant DAAG29-79-G-0015)
(AD-A113239; UVA/525098-MAE-82/10; ARO-16091.5-E) Avail: NTIS HC A03/MF A01 CSCL 20/11

This report summarizes the accomplishments of a study exploring new methods for the vibration control of helicopters. Reanalysis methodology permits a variety of vibration control problems to be solved efficiently. Both analytical and experimental studies have been conducted.
Author (GRA)

N82-28302# Air Force Human Resources Lab., Brooks AFB, Tex.
MANUAL REVERSION FLIGHT CONTROL SYSTEM FOR A-10 AIRCRAFT: PILOT PERFORMANCE AND SIMULATOR CUE EFFECTS Final Report
Thomas H. Gray Mar. 1982 31 p refs
(AF Proj. 1123)
(AD-A113463; AFHRL-TR-81-53) Avail: NTIS HC A03/MF A01 CSCL 14/2

The A-10 aircraft incorporates an emergency backup control mode, the Manual Reversion Flight Control System (MRFCS). Maintaining effective control in this mode is a demanding pilot task, but it is not practiced in the flying training syllabus. Because current plans call for training this skill using simulation, information was needed on simulator cue requirements. Accordingly, the research objective was to determine the effectiveness of selected simulator visual and force cues used by experienced A-10 pilots to maintain aircraft control and to land when in the MRFCS mode. The study found that (1) a large field of view enhanced the pilot's control of the aircraft; (2) platform motion had no influence upon aircraft control; (3) aircraft control was more difficult in the MRFCS mode than in the simple single engine failure state; (4) point of failure was a significant variable reliably affecting pilot control of the aircraft; and (5) pilot performance improved as a function of practice (trials).
Author (GRA)

N82-28303# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.
THE DETERMINATION OF GUST LOADS ON NONLINEAR AIRCRAFT USING A POWER SPECTRAL DENSITY APPROACH
R. Noback and C. Lasuboder 17 Dec. 1980 80 p refs
(Contract NIVR-RB-1854)
(NLR-TR-80123-U) Avail: NTIS HC A05/MF A01

Since the power spectral density method cannot determine the exceedance of the output over the input in the nonlinear equations which describe an aircraft subjected to atmospheric turbulence, methods which approximate the exceedance curve were developed. One method is analogous to the classical expression for the equivalent gain. Another is analogous to the equivalent gain based on minimum error in energy. In both, the maximum value (mu zy) of the cross correlation function between output and input to the nonlinearity is used. A reasonable estimate of the exceedance curve, for systems for which mu zy is not known, can be obtained if the correlation between the input to the nonlinearity (z) and the system output (y) is high. The ratio of the standard deviations of z and y can then be used. Design loads based on mission analysis can be established once the load exceedance curve due to constant standard deviation of the input is known. A definition for the design load of nonlinear aircraft using the design envelope method is proposed.
Author (ESA)

N82-28306# Seville Research Corp., Pensacola, Fla.
OPERATIONAL TEST AND EVALUATION HANDBOOK FOR AIRCREW TRAINING DEVICES. VOLUME 3: OPERATIONAL SUITABILITY EVALUATION Final Report
William V. Hagin, Stephen R. Osborne, Roik L. Hockenberger, James P. Smith, and Thomas H. Gray (Operations Training Div., Williams AFB, Ariz.) AFHRL Brooks AFB, Tex. Feb. 1982 128 p refs
(Contract F33615-78-C-0063; AF Proj. 1123)
(AD-A112569; AFHRL-TR-81-44-Vol-3) Avail: NTIS HC A07/MF A01 CSCL 05/9

The Handbook is comprised of three volumes and is intended to provide guidelines and procedures appropriate for Air Force Operational Test and Evaluation (OT&E) personnel to use in planning, conducting and reporting the results of simulator assessment efforts. Although of value to all test personnel, it is primarily for the typical novice test manager/director - a person who has subject matter expertise (e.g., a qualified pilot or operator), but who may have little or no previous OT&E experience. The Handbook provides detailed coverage on OT&E planning and management with special emphasis on measuring device operational effectiveness and suitability. In accord with its objectives, the Handbook was prepared to serve as a supplement to Air Force Manual 55-43, 'Management of Operational Test and Evaluation,' but providing those specific additional evaluation concepts and techniques mecessary for aircrew training device test and evaluation. GRA

N82-28307# Strategic Air Command, Offutt AFB, Nebr. Aircraft Engineering Div.
ALERT AIRCRAFT ROLL OVER CHOCKS Final Engineering Report
John M. Connolly 14 Aug. 1981 53 p
(AD-A107456; SAC/LGME-ER-P-372) Avail: NTIS
HC A04/MF A01 CSCL 01/5

The feasibility of restraining a parked alert aircraft with chocks which could be safely taxied over was studied. Chocks were designed and then evaluated during SAC Giant Match II exercise. The chocks successfully restrained a parked aircraft and allowed a heavy weight aircraft to safely taxi over when the chocks were placed on a rough surface. Roll-over check use was expanded command wide for B-52G and KC-135 alert aircraft except on icy surfaces. Three ice gripping surface designs were evaluated. All three designs performed successfully. Author

N82-28309# Naval Training Equipment Center, Orlando, Fla. Advanced Simulation Concepts Lab.
COMPUTER PROGRAM FOR ANALYSIS OF SPHERICAL SCREEN DISTORTION Technical Report, Oct. 1980 - Feb. 1981
Richard C. Hebb Mar. 1982 71 p refs
(AD-A113136; NAVTRAEQUIPC-IH-332) Avail: NTIS
HC A04/MF A01 CSCL 05/9

In visual simulation, the distortion of imagery in wide-angle display systems is a major concern. Effective flight training requires that the imagery presented to a trainee provide a proper perspective view of his simulated enyironment without distortion. Use of spherical screens (domes) introduces perspective and geometrical distortion into these wide-angle displays. Use of video projection systems with Computer Image Generation (CIG) offers the options of raster shaping or computer remapping for distortion correction. The method is to correct the imagery before projection in order to provide a non-distorted scene to a trainee. This report is documentation of a computer program for analysis of the required raster correction for specific projector/viewpoint positioning within a spherical screen. The programs and report were initiated to provide input to the F-18 simulator (Device 2E7) being developed by Hughes Aircraft. Author (GRA)

N82-28310# Aeronautical Research Labs., Melbourne (Australia).
PROGRAMS FOR THE TRANSONIC WIND TUNNEL DATA PROCESSING INSTALLATION. PART 8: PROGRAMS FOR PROCESSING DATA ON THE CENTRAL SITE COMPUTER
B. D. Fairlie Sep. 1980 32 p refs
(AD-A112900; ARL/AERO-TM-324-Pt-8) Avail: NTIS
HC A03/MF A01 CSCL 09/2

Three programs which run on the central site computer (PDP-10) are described. The first, PLT8 complements and extends the tunnel installation six-component force data plotting system. The second, INTEG integrates aerofoil surface pressure measurements. The third, PLTALL plots these surface pressure data. Author (GRA)

N82-28311# Aeronautical Research Labs., Melbourne (Australia).
DESIGN BASIS FOR A NEW TRANSONIC WIND TUNNEL
J. B. Willis and N. Pollock Jan. 1982 27 p refs
(AD-A112899; ARL/Aero-TM-335; AR-002-326) Avail: NTIS
HC A03/MF A01 CSCL 14/2

The existing ARL Transonic Wind Tunnel, which is the largest such tunnel in Australia, has severely limited testing capabilities due to a low test Reynolds number and an inadequate test section size. These deficiencies are becoming more acute as military aircraft performance capabilities increase. For current fighter aircraft, the ratio of tunnel test to flight Reynolds number is about 1:100 and the extrapolation of tunnel data to flight carries a high risk of serious error and for some conditions is not possible at all. The small test section size limits the scale of the models which can be tested. The difficulty of machining small models to the required accuracy produces excessive manufacturing times. Moreover, it is not possible to incorporate remotely adjusted control surfaces. These two factors severely restrict tunnel productivity. Given adequate support, it should be possible to build and commission a suitable new wind tunnel in about five years, at a cost substantially less than that of a single military fighter aircraft. GRA

N82-28364# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Information und Dokumentation.
CARBON FIBER REINFORCED COMPOSITE STRUCTURES PROTECTED WITH METAL SURFACES AGAINST LIGHTNING STRIKE DAMAGE
C. M. Heckert, H. P. Wentzel (Vereinigte Flugtechnische Werke GmbH), and G. Boes (Tech. Univ., Hanover) 1982 9 p Presented at Intern. Aerospace Conf. on Lightning and Static Elec., Culham, England, 23-25 Mar. 1982
(MBB-UD-340-82-O/E) Avail: Issuing Activity

Lightning protection for carbon fiber reinforced composite (CFC) structures, typical of parts mainly located on the surface of aircraft, was investigated. Only direct structural, effects of a lightning strike on a component were considered. As protective materials, flame sprayed aluminum, aluminum mesh, aluminum foil, and aluminum/glass hybrid fabrics were tested. Three specimen geometries were studied: (1) solid CFC plates 2 and 3 mm thick; (2) sandwich plates with CFC facing of different thickness and with different core material (aluminum and Nomex) 10 mm through; and (3) electrically bonded test specimen composed of a solid CFC plate and metal substructure. The test rig for simulating lightning discharges is described. Results consist of damage diagrams, showing specimen type, applied electrical discharge, and damaged area on protective surface and composite structure. Author (ESA)

N82-28366# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Information und Dokumentation.
DEVELOPMENT OF MATERIALS AND MANUFACTURING TECHNOLOGY OVER THE NEXT 20 YEARS: COMPOSITE MATERIALS [ENTWICKLUNG DER WERKSTOFF- UND FERTIGUNGSTECHNIK IN DEN NAECHSTEN 20 JAHREN - VERBUNDWERKSTOFFE]
C. M. Heckert 1982 17 p In GERMAN Presented at Wehrtech. Symp. Entwicklung der Werkstoffe- u. Fertigungstech. in den naechsten 20 Jahren, Mannheim, West Germany, 17 Dec. 1981; sponsored by Bundesakademie fuer Wehrverwaltung und Wehrtechnik, Mannheim, West Germany
(MBB-UD-341-82-O) Avail: Issuing Activity

The development of reinforced plastics and their application in various manufacturing processes are reviewed. The choice of CFRP or glass fiber reinforced plastic in military and commercial aircraft design is justified by higher specific strength and stiffness properties than alternative metals. Other applications are found in automobiles, railway cars, and helicopters. Size and mass reduction in parts as well as production cost savings are mentioned. Influence on manufacturing of component geometry (rod; plate; complex) is considered. The interrelationship of manufacturing capability with composite materials development is stressed through examples from industry. Author (ESA)

N82-28462# Suntech, Inc., Marcus Hook, Pa.
AN EXPLORATORY RESEARCH AND DEVELOPMENT PROGRAM LEADING TO SPECIFICATIONS FOR AVIATION TURBINE FUEL FROM WHOLE CRUDE SHALE OIL. PART 1: PRELIMINARY PROCESS ANALYSES Interim Report, 2 Jan. - 1 Jul. 1979
H. E. Reif, J. P. Schwedock, and A. Schneider Wright-Patterson AFB, Ohio AFWAL Sep. 1981 48 p refs 3 Vol.
(Contract F33615-78-C-2024; AF Proj. 3048)
(AD-A112681; AFWAL-TR-81-2087-Pt-1) Avail: NTIS
HC A03/MF A01 CSCL 21/4

Preliminary process analyses of three different technically feasible processing schemes proposed by SUN TECH, INC. for converting 100,000 BPCD of raw Paraho shale oil into military turbine fuels was investigated. Each processing scheme is based on very limited, but pertinent, data generated by SUN TECH plus literature sources. The base processing scheme consists of severe hydrotreating followed by sulfuric acid extraction; the two alternate cases utilize moderate hydrotreating plus extraction for nitrogen removal and hydrocracking. Screening-type process designs and costs estimates were prepared for each case using electromagnetic environment is reviewed. All aspects and phases are discussed. A model is chosen for each phase which best describes what is currently known and understood. Computer models for predicting the electromagnetic environment for several of the processes are given, along with numerical predictions. A comprehensive bibliography is also provided. Author

N82-29801# Lightning and Transients Research Inst., Melbourne, Fla.
ATMOSPHERIC ELECTRICITY HAZARDS ANALYTICAL MODEL DEVELOPMENT AND APPLICATION. VOLUME 2: SIMULATION OF THE LIGHTNING/AIRCRAFT INTERACTION EVENT Final Report, Aug. 1979 - Jun. 1981
John D. Robb Wright-Patterson AFB, Ohio AFWAL Jun. 1981 59 p refs 3 Vol.
(Contract F33615-79-C-3412; AF Proj. 2402)
(AD-A114016; EMA-81-R-21-Vol-2;
AFWAL-TR-81-3084-Vol-2) Avail: NTIS HC A04/MF A01
CSCL 04/1

A review of currently used lightning test techniques for aircraft is given. The requirements for lightning simulation are given and discussed. Finally, a new approch for simulating the lightning/aircraft interaction is presented, and is based on nuclear electromagnetic pulse (NEMP) technology. GRA

N82-29802# Electro Magnetic Applications, Inc., Denver, Colo.
ATMOSPHERIC ELECTRICITY HAZARDS ANALYTICAL MODEL DEVELOPMENT AND APPLICATION. VOLUME 3: ELECTROMAGNETIC COUPLING MODELING OF THE LIGHTNING/AIRCRAFT INTERACTION EVENT Final Report, Aug. 1979 - Jun. 1981
F. J. Eriksen, T. H. Rudolph, and Rodney Perala Wright-Patterson AFB, Ohio AFWAL Jun. 1981 330 p refs 3 Vol.
(Contract F33615-79-C-3412; AF Proj. 2402)
(AD-A114017; EMA-81-R-21-Vol-3;
AFWAL-TR-81-3084-Vol-3) Avail: NTIS HC A15/MF A01
CSCL 04/1

The state of the art of coupling of electromagnetic fields to aircraft is reviewed. Assessing the electromagnetic interaction of lightning with aircraft is considered. The coupling process is explained and the modeling requirements implied by the lightning environment are discussed. The description of models selected and implemented is given. Author

N82-29996# Systems Control, Inc., Palo Alto, Calif.
SYSTEM IDENTIFICATION OF NONLINEAR AERODYNAMIC MODELS
T. L. Trankle, J. H. Vincent, and S. N. Franklin *In* AGARD Advan. in the Tech. and Technol. of the Appl. of Nonlinear Filters and Kalman Filters Mar. 1982 26 p refs (For primary document see N82-29989 20-64)
Avail: NTIS HC A23/MF A01

System identification, a technology for determining a mathematical model of a dynamic system from observations of its response to inputs is discussed. Identification technology is used for the determination of nonlinear aerodynamic models for aircraft maneuvering at high angles of attack. The method outlined here (equation error, output error, and maximum likelihood algorithms) can directly nonlinear aerodynamic coefficients in table look-up or multivariable spline formats. For application to nonlinear problems, the basic algorithms are enhanced by recent techniques for evaluation of partial derivatives of the likelihood function, calculation of parameter estimation uncertainties, and by the use of multidimensional splines as a generic model structure. An example application of these methods to the identification of F-4S fighter aircraft high angle of attack aerodynamics is illustrated. B.W.

N82-30013*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
APPLICATIONS TO AERONAUTICS OF THE THEORY OF TRANSFORMATIONS OF NONLINEAR SYSTEMS
George Meyer, Renjeng Su, and L. R. Hunt May 1982 13 p refs
(Contract N00014-76-C-1136)
(NASA-TM-84249; NAS 1.15:84249; A-8943) Avail: NTIS HC A02/MF A01 CSCL 12B

The development of the transformation theory is discussed. Results and applications concerning the use of this design technique for automatic flight control of aircraft are presented. The theory examines the transformation of nonlinear systems to linear systems. The tracking of linear models by nonlinear planes is discussed. Results of manned simulation are also presented. B.W.

N82-30029# Federal Aviation Administration, Washington, D.C.
ESTIMATED AIRPLANE NOISE LEVELS IN A-WEIGHTED DECIBELS
11 Feb. 1981 19 p refs
(AC-36-3B) Avail: NTIS HC A02/MF A01

Listings of estimated airplane noise levels in units of A-Weighted Sound Level in decibels (dBA) are provided. N.W.

N82-30030*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
FORWARD VELOCITY EFFECTS ON FAN NOISE AND THE SUPPRESSION CHARACTERISTICS OF ADVANCED INLETS AS MEASURED IN THE NASA-AMES 40 BY 80 FOOT WIND TUNNEL Final Report
Michael T. Moore May 1980 161 p refs
(Contract NAS2-8675)
(NASA-CR-152328; NAS 1.26:152328; R79AEG626) Avail: NTIS HC A08/MF A01 CSCL 20A

Forward velocity effects on the forward radiated fan noise and on the suppression characteristics of three advanced inlets relative to a baseline cylindrical inlet were measured in the NASA Ames Research Center 40 x 80 foot Wind Tunnel. A modified JT15D turbofan engine in a quiet nacelle was the source of fan noise; the advanced inlets were a Conventional Takeoff/Landing (CTOL) hybrid inlet, a Short Takeoff/Landing (STOL) hybrid inlet, and a treated deflector inlet. Also measured were the static to flight effects on the fan noise of canting the baseline inlet 4 deg downward to simulate typical wing mounted turbofan engines. The CTOL hybrid inlet suppressed the high tip speed fan noise as much as 18 PNdB on a 61 m (200 ft) sideline scaled to a CF6 size engine while the STOL hybrid inlet suppressed the low tip speed fan noise as much as 13 PNdB on a 61 m (200 ft) sideline scaled to a QCSEE size engine. The deflector inlet suppressed the high tip speed fan noise as much as 13 PNdB at 61 m (200 ft) overhead scaled to a CF6 size engine. No significant changes in fan noise suppression for the CTOL and STOL hybrid inlets occurred for forward velocity changes above 21 m/s (68 ft/s) or for angle of attack changes up to 15 deg. However, changes in both forward velocity and angle of attack changed the deflector inlet noise unpredictably due to the asymmetry of the inlet flow field into the fan. Author

N82-30031# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 148. T-37B IN-FLIGHT CREW NOISE
Harald K. Hille Nov. 1981 15 p
(AF Proj. 7231)
(AD-A114943; AMRL-TR-75-50-Vol-148) Avail: NTIS HC A02/MF A01 CSCL 01/2

The T-37B is a USAF two-seat primary trainer aircraft. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported at one location for 19 different flight conditions and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. GRA

N82-30032# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
FAR-FIELD ACOUSTIC DATA FOR THE TEXAS ASE, INC. HUSH HOUSE
Robert A. Lee Apr. 1982 287 p refs
(AF Proj. 7231)
(AD-A114564; AFAMRL-TR-81-148) Avail: NTIS HC A13/MF A01 CSCL 01/2

This report supplements AFAMRL-TR-73-110, which describes the data base (NOISEFILE) used in the computer program (NOISEMAP) to predict the community noise exposure resulting from military aircraft operations. The results of field test measurements to define the single-event noise produced on the ground by military aircraft/engines operating in the Texas ASE Inc. hush-house are presented as a function of angle (0 deg to 180 deg from the front of the hush-house) and distance (200 ft to 2500 ft) in various acoustic metrics. All the data are normalized to standard acoustic reference conditions of 59 F temperature and 70% relative humidity. Refer to Volume I of the AFAMRL-TR-73-110 report for discussion of the scope, limitations, and definitions needed to understand and use the data in this report. GRA

N82-30261# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

WIND TUNNEL STUDIES OF STORE SEPARATION WITH LOAD FACTOR. FREEDROPS AND CAPTIVE TRAJECTORIES c02

J. Coste and J. Leynaert *In its* La Rech. Aerospatiale, Bi-monthly Bull. no. 1982-1, Jan.-Feb. 1982 (ESA-TT-755) May 1982 p 1-9 refs Transl. into ENGLISH from La Rech. Aerospatiale, Bull. Bimestrial (Paris), No. 1982-1, Jan.-Feb. 1982 (For primary document see N82-30260 20-99)
Avail: NTIS HC A02/MF A01; original report in FRENCH available at ONERA, Paris FF 55

Techniques used to study separation trajectories of stores dropped from under an aircraft are described. In dropping tests, light, heavy and intermediate scaling laws which respect the Mach number are studied. The captive trajectory tests use a six degrees of freedom system which moves the model step by step in the aerodynamic field of the aircraft. Aerodynamic forces acting on the store are measured by an internal balance. This method does not take into account the relative speed of store and aircraft. Arrangements used to compensate for this defect are shown. When the stores are inert, have perturbed trajectories, high initial separation speeds, or are incompatible with an external mount and an internal balance, the freedrop method is preferable, particularly for short trajectories. In the contrary cases, or when the store is propelled, the captive trajectory method is essential. For long trajectories, with several phases, the two methods are used in conjunction. Author (ESA)

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19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 587-596. 7 refs. (AIAA 82-1611)
(Previously announced in STAR as N82-22281)

A82-38995 # Target acquisition system/air-to-surface weapon compatibility analysis. A. R. Mitchell (Analytic Sciences Corp., Reading, MA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 636-642. (AIAA 82-1618)

The paper presents a simple, closed form method which has been developed for compatibility analysis of an autonomous target acquisition system with an air-to-surface weapon. The output is a probability distribution for expected target location at the moment of potential weapon release. Compatibility is measured by the probability that the target lies in the footprint of the released weapon. The method uses statistical input data on terrain masking, atmospheric obscuration, and the acquisition system timeline from first target detection through classification, designation and weapon release. Generic results are presented for a hypothetical target acquisition system. (Author)

A82-38998 # The Shiryayev sequential probability ratio test for redundancy management. J. L. Speyer and J. E. White (Texas, University, Austin, TX). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 658-666. 10 refs. (AIAA 82-1623)

An essential aspect in the design of fault tolerant digital flight control systems is the design of failure detection and redundancy management systems. A decision rule, the Shiryayev sequential probability ratio test (SPRT), is used to detect failures between similar instruments, as well as between dissimilar instruments through analytic redundancy. Unlike the Wald SPRT, which tests for the presence of failure or no failure in all of the data sequence, the Shiryayev SPRT detects the occurrence of a fault in the data sequence in minimum time if certain conditions are met. The performance of the Shiryayev SPRT in detecting a failure between two rate gyros as compared to standard fixed interval schemes is presented, as is the performance for a single accelerometer failure using translational kinematic equations to form a parity relation for analytic redundancy. (Author)

A82-39003 # X-29A flight control system design experiences. J. Chin, H. Berman, and J. Ellinwood (Grumman Aerospace Corp., Bethpage, NY). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 703-713. 11 refs. (AIAA 82-1538)

The X-29A aircraft is a technology demonstrator consisting of a structurally tailored forward swept wing, an automatic camber control concept to increase aerodynamic efficiency, a high level of aircraft relaxed static stability (RSS), and a digital fly-by-wire flight control system using control laws designed via modern optimal control techniques. A description is presented of the considerations exercised during the design and development of the flight control system (FCS), and attention is given to the uniqueness of the X-29A aircraft which led to high levels of RSS for minimum FCS requirements. The advantages of RSS are discussed along with the longitudinal control requirements, the control modes, aspects of control law development, and questions of flight control system validation. G.R.

A82-39009 * # The effects of atmospheric turbulence on a quadrotor heavy lift airship. M. B. Tischler and H. R. Jex (Systems Technology, Inc., Hawthorne, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 767-776. 15 refs. Contract No. NAS2-10330. (AIAA 82-1542)

The response of a quadrotor heavy lift airship to atmospheric turbulence is evaluated using a four-point input model. Results show interaction between gust inputs and the characteristic modes of the vehicle's response. Example loop closures demonstrate tradeoffs between response regulation and structural loads. Vehicle responses to a tuned discrete wave front compare favorably with the linear results and illustrate characteristic HLA motion. (Author)

A82-39011 # Analyzing stable pad disturbances and design of a sensor vault to monitor pad stability. O. D. Starkey, J. D. Kerr, and L. D. Hall (Teledyne, Inc., Teledyne Geotech, Garland, TX). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 785-788. (AIAA 82-1585)

Among disturbing environmental mechanisms are tidal variations in gravity, natural and cultural seismic activity, and acoustic excitation of components. An analysis is presented of these disturbances. Also described is the development of a vault that isolates the sensors from external disturbances yet provides close coupling to the test pad. Initial tests carried out on a prototype vault installed in February 1982 show that a feedback-type seismometer can include a sustained oscillation within its housing. A possible analysis of this phenomenon is included. C.R.

A82-39013 # Avoiding the pitfalls in automatic landing control system design. A. A. Lambregts (Boeing Commercial Airplane Co., Seattle, WA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 799-809. (AIAA 82-1599)

This paper relates recent experiences at Boeing with the development and flight testing of improved automatic landing flare control laws for the B-737 and B-747 aircraft. Some earlier designs and their limitations are reviewed. Basic requirements for flare law initiation, command synchronization, feedback signal sources and characteristics, inner loop configurations, elevator control band width and throttle control are discussed. Experiences and potential pitfalls in the development of integrated glide slope and flare control laws for improving an existing B-747-SP design and for a new B-737 SP-177 autopilot are described. Analog computer design constraints are reviewed. A 'variable tau' flare law concept, using groundspeed to reduce longitudinal dispersion and achieve a constant flare height are discussed as well as an 'explicit trajectory' flare control concept to achieve the same goals, along with flight test results. New design options using digital computers are pointed out. (Author)

A82-39016 # Flight control synthesis using robust output observers. E. G. Rynaski (Calspan Advanced Technology Center, Buffalo, NY). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 825-831. (AIAA 82-1575)

A brief investigation is made of the application of robust output observer theory to the design of flight control systems for advanced aircraft configurations. Observer theory is seen as a natural design tool because the resulting observers are in themselves unobservable and do not increase the order of the closed-loop response, thereby more closely satisfying flying qualities requirements. Examples are adduced to show that the observer configuration is not unique in either the observer poles or the output sensors and that many different control system configurations using a variety of sensors can be designed to yield identical closed-loop dynamic behavior. In this way, it becomes possible to incorporate considerable analytic and physical redundancy into nearly any flight control system. C.R.

A82-39081 # Handling qualities criteria for flight path control of V/STOL aircraft. M. B. Tischler and R. H. Hoh (Systems Technology, Inc., Hawthorne, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1292.* 10 p. 14 refs. Contract No. N62269-80-C-0290.

Tentative handling qualities criteria for V/STOL path control have been developed based on a study of bandwidth requirements and lower-order equivalent system representations. This work extends the equivalent system concept from singleloop to multiloop applications. Numerical results show the significant influence of inter-axis coupling on maximum attainable piloted bandwidth. Preliminary fixed-base simulation results verify the expected trends and correlate well with the analytically derived boundaries proposed in this paper. (Author)

A82-39082 * # Piloted simulator evaluation of a relaxed static stability fighter at high angle-of-attack. M. Lapins, R. W. Klein, R. P. Martorella, J. Cangelosi (Grumman Aerospace Corp., Bethpage, NY), and W. R. Neely, Jr. (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1295.* 19 p. 10 refs.

A piloted simulator evaluation of the stability and control characteristics of a relaxed static stability fighter aircraft was conducted using a differential maneuvering simulator. The primary purpose of the simulation was to evaluate the effectiveness of the limiters in preventing departure from controlled flight. The simulation was conducted in two phases, the first consisting of open-loop point stability evaluations over a range of subsonic flight conditions, the second concentrating on closed-loop tracking of a preprogrammed target in low speed, high angle-of-attack air combat maneuvering. The command limiters were effective in preventing departure from controlled flight while permitting competent levels of sustained maneuvering. Parametric variations during the study included the effects of pitch control power and wing-body static margin. Stability and control issues were clearly shown to impact the configuration design. C.D.

A82-39083 # In-Flight investigation of large airplane flying qualities for approach and landing. N. C. Weingarten and C. R. Chalk (Calspan Advanced Technology Center, Buffalo, NY). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1296.* 13 p. 9 refs. Contract No. F33615-79-C-3618.

A study of the handling qualities of large airplanes in the approach and landing Flight Phase was performed utilizing the USAF-AFWAL/Calspan Total In-Flight Simulator. A one-million pound statically unstable airplane model was used as a baseline about which variations were made. The primary variables were relative pilot position with respect to center of rotation, command path time delays and phase shifts, augmentation schemes and levels of augmentation. The results indicate that the approach and landing task with very large airplanes is a fairly low bandwidth task. Low equivalent short-period frequencies and relatively long time delays can be tolerated. As the pilot position is moved aft towards and then behind the center of rotation, pilot ratings are degraded. (Author)

A82-39084 * # **Development and flight test evaluation of a pitch stability augmentation system for a relaxed stability L-1011.** J. J. Rising (Lockheed-California Co., Burbank, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1297.* 10 p. 5 refs. Contract No. NAS1-15326.

The L-1011 has been flight tested to demonstrate the relaxed static stability concept as a means of obtaining significant drag benefits to achieve a more energy efficient transport. Satisfactory handling qualities were maintained with the design of an active control horizontal tail for stability and control augmentation to allow operation of the L-1011 at centers of gravity close to the neutral point. Prior to flight test, a motion base visual flight simulator program was performed to optimize the augmentation system. The system was successfully demonstrated in a test program totaling forty-eight actual flight hours. (Author)

A82-39085 # **Supersonic missile aerodynamic and performance relationships for low observables mission profiles.** R. J. Krieger (McDonnell Douglas Astronautics Co., St. Louis, MO). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1298.* 11 p. 6 refs.

Closed-form analytical relationships are developed between supersonic missile aerodynamic characteristics such as lift, zero-lift drag and drag due-to-lift and performance parameters such as range, velocity, specific range, flight path angle and maneuver load factor. These relationships apply to low observable missile flight profiles for long range cruise and glide missions. The analytical relationships are developed for climb, cruise, glide, dive, and run-in segments. The results include equations for use in closed-form performance estimates and guiding configuration development. (Author)

A82-39090 * # **Applications of parameter estimation in the study of spinning airplanes.** L. W. Taylor, Jr. (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1309.* 7 p. 12 refs.

Spinning airplanes offer challenges to estimating dynamic parameters because of the nonlinear nature of the dynamics. In this paper, parameter estimation techniques are applied to spin flight test data for estimating the error in measuring post-stall angles of attack, deriving Euler angles from angular velocity data, and estimating nonlinear aerodynamic characteristics. The value of the scale factor for post-stall angles of attack agrees closely with that obtained from special wind-tunnel tests. The independently derived Euler angles are seen to be valid in spite of steep pitch angles. Estimates of flight derived nonlinear aerodynamic parameters are evaluate; in terms of the expected fit error. (Author)

A82-39091 * # **Analysis of general-aviation accidents using ATC radar records.** R. C. Wingrove and R. E. Bach, Jr. (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1310.* 8 p. 12 refs.

It is pointed out that general aviation aircraft usually do not carry flight recorders, and in accident investigations the only available data may come from the Air Traffic Control (ATC) records. A description is presented of a technique for deriving time-histories of aircraft motions from ATC radar records. The employed procedure involves a smoothing of the raw radar data. The smoothed results, in combination with other available information (meteorological data and aircraft aerodynamic data) are used to derive the expanded set of motion time-histories. Applications of the considered analytical methods are related to different types of aircraft, such as light piston-props, executive jets, and commuter turboprops, as well as different accident situations, such as takeoff, climb-out, icing, and deep stall. G.R.

A82-39092 * # **An estimation of aerodynamic forces and moments on an airplane model under steady state spin conditions.** B. N. Pamadi and L. W. Taylor, Jr. (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1311.* 14 p. 21 refs.

The problem of estimating the aerodynamic characteristics of a wing body configuration of a spinning airplane at extreme angles of attack and spin rates is approached by the application of strip theory. Semiempirical methods are used to estimate the aerodynamic force distributions over each component using static, nonrotational wind-tunnel test data. To these predictions, corrections are applied to account for the primary rotational flow effects which are significant at large spin rates. The results of this modified strip theory are shown to be in good agreement with spin tunnel rotary balance test data. (Author)

A82-39093 * # **A simple, low cost application of a flight test parameter identification system.** R. Clarke and J. Roskam (Kansas, University, Lawrence, KS). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1312.* 9 p. 9 refs. Grant No. NsG-4019.

The flight test system combines state-of-the-art microprocessor technology and high accuracy instrumentation with parameter identification technology which minimize data and flight time requirements. The system was designed to avoid permanent modifications of the test airplane and allow quick installation. It is capable of longitudinal and lateral-directional stability and control derivative estimation. This paper presents details of this system, calibration and flight test procedures, and the results of the Cessna 172 flight test program. The system has proven easy to install, simple to operate, and capable of accurate estimation of stability and control parameters in the Cessna 172 flight tests. (Author)

A82-39094 # **Parameter estimation applied to general aviation aircraft - A case study.** W. R. Wells (Wright State University, Dayton, OH) and V. Klein (George Washington University, Washington, DC; Joint Institute for Advancement of Flight Sciences, Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1313.* 12 p. 27 refs.

NASA is currently involved in extensive general aviation stall-spin studies. In undertaking the stall-spin research, the aircraft dynamics in pre and post stall regimes must be understood. A case study is presented of the application of parameter estimation methods to problems of general aviation aircraft. The research areas considered are related to control input selection, data compatibility, identification algorithms, unsteady aerodynamic modeling, and model structure determination. Several recent advances in the application of systems identification are summarized using the aircraft as subject. These advances are concerned with such techniques as stepwise regression algorithms, design of optimal control selection for parameter estimation, use of Kalman filtering in data compatibility checks, frequency domain identification algorithms, and high angle of attack formulation. It is shown that the discipline of systems identification can be quite effective in improving the knowledge of the flight mechanics of general aviation aircraft. G.R.

A82-39096 * # **Dynamic load measurements with delta wings undergoing self-induced roll-oscillations.** D. Levin and J. Katz (Technion-Israel Institute of Technology, Haifa, Israel). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1320.* 11 p. 11 refs. Grant No. NAGW-00218.

The aerodynamic forces acting on a delta wing, mounted on a free-to-roll sting-balance apparatus, were measured. Two wing planforms having leading edge sweeps of 76 and 80 deg were tested, but only the wing with the 80 deg sweep would undergo periodic self-induced roll oscillation. The time dependent forces and roll angles for this wing were then recorded for various test conditions. In these tests a considerable drop in the average normal force of the free-to-roll wing was measured, relative to the normal force obtained in the static tests. Also, the helium-bubble flow visualization technique was used to gain some insight into the periodic motion of the separated leading edge vortices. (Author)

A82-39098 * # **High angle-of-attack characteristics of a forward-swept wing fighter configuration.** S. B. Grafton, W. P. Gilbert, M. A. Croom, and D. G. Murri (NASA, Langley Research Center, Hampton, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1322.* 19 p. 13 refs.

The NASA-Langley Research Center is currently investigating the high angle-of-attack characteristics of a forward-swept wing fighter technology demonstrator in a cooperative program with the Defense Advanced Research Projects Agency. The program includes static and dynamic wind-tunnel force tests, free-flight model tests, spin-tunnel tests, and piloted simulation. Particular emphasis is placed on identifying the contributions of the forward-swept wing to the configuration aerodynamics at high angles of attack. Results are presented to illustrate the wing contributions in terms of aerodynamic stability, flow visualization, and observation of free-flight characteristics. (Author)

A82-39100 # **The use of small strakes to reduce interference drag of a low wing, twin engine airplane.** T. E. Wallis, D. R. Ellis (Cessna Aircraft Co., Wichita, KS), and W. H. Wentz, Jr. (Wichita State University, Wichita, KS). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1323.* 13 p. 5 refs.

This paper discusses the effect of small strakes on the interference drag of a low wing, twin engine airplane. The strakes, highly swept delta wing semi-spans with a root chord 18 percent of the wing MAC, provide a strong streamwise vortex at high angles of attack. They are placed on the fuselage and nacelles at the wing leading edge. Both full scale and wind tunnel tests are discussed. The strakes, in the proper location, provide a reduction in interference drag. Increases in

In connection with the growing need for Instrument Flight Rule (IFR) operations in both military and commercial applications, considerable emphasis has been placed on helicopter utilization in adverse weather conditions. As a corollary to this requirement, investigations have been conducted with the aim to permit the operation of helicopters under icing conditions. Attention is given to test results, a natural icing performance analysis, the need for a deicing system, and icing certification criteria. It is found that the impracticality and expense involved in testing helicopters to the full extent of the requirements of FAR Part 25 makes the need for LIMITED icing releases a real one. Recognition of specific helicopter attributes and shortcomings is highly desirable for this type of certification. G.R.

A82-40524 # **An evaluation of helicopter autorotation assist concepts.** G. T. White (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA), A. H. Logan, and J. D. Graves (Hughes Helicopters, Inc., Culver City, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 194-216. 11 refs. Grant No. DAAK51-80-C-0011.

The unique autorotation capability of the helicopter is an inherent safety feature which is heavily relied upon during power failure emergencies. However, the autorotation maneuver places great demands on pilot skill. An analytical study was conducted of autorotation improvement devices. These devices were evaluated using both weight and preliminary performance analyses. The three most promising concepts were carried through preliminary design. It was found that no significant gain in autorotation performance can be achieved by only the management of available baseline energy. Supplemental energy must be supplied. The use of a simple Autorotative Index is a good tool for the initial determination of the auxiliary power level required for good autorotative characteristics. The autorotative characteristics of a single-engine scout helicopter can be substantially improved with the combination of a MIL-STD-1290 type landing gear and either a Tip Jet, Flywheel or Auxiliary Turbine system. G.R.

A82-40525 # **Predesign study for an advanced flight research rotor.** R. H. Blackwell, T. G. Campbell (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT), and R. B. Taylor (United Technologies Research Center, East Hartford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 217-234. 11 refs.

A flight research rotor program aimed at demonstrating significant improvements in aerodynamic performance and reductions in vibration and noise is outlined. The benefits and practical design considerations of approximately a dozen advanced rotor concepts were considered and three concepts were chosen for inclusion in the flight research program. Detailed design of a blade permitting experimental study of tip shape, a tuned trailing edge tab system and blade mass distribution is presented. The design issues addressed in connection with the research blade are shown to have general applicability. Finally the total program required to develop these concepts including further analysis, model test, ground tests and flight test is outlined. (Author)

A82-40526 # **Sikorsky ACAP preliminary design.** B. F. Kay (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-4050520-01) Washington, DC, American Helicopter Society, 1982, p. 235-238A.

Sikorsky Aircraft is currently under contract to the U.S. Army to conduct an Advanced Composite Airframe Program (ACAP). The basic objectives of the ACAP are to demonstrate the weight and cost saving potential of advanced composite materials when used to the maximum extent possible in an airframe designed to meet stringent military requirements. This paper will describe Sikorsky's ACAP helicopter and the approaches used to minimize weight, reduce manufacturing costs and achieve high levels of crashworthiness, survivability, reliability, and maintainability. (Author)

A82-40527 # **Conceptual design of the LHX integrated cockpit.** R. R. Pruyn and R. E. Domenic (Boeing Vertol Co., Philadelphia, PA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 239-246. 9 refs.

The present investigation is concerned with the application of computer-based technology to the next generation of Army tactical aircraft. Attention is given to missions which drive cockpit design, the potential benefits of improved displays, developments in automation, questions regarding the merits of displays versus windows, mockups to develop design, aspects of display capability and flight safety, concepts in image processing, crew workload studies, assumptions for workload analysis, workload methodology, and the results of workload analysis. It is concluded that with the anticipated automation, controls, and displays, one crewman can efficiently perform all of the desired tactical scout and attack tasks. For next-generation aircraft a wide-field-of-view panel or helmet-mounted display is needed since it reduces pilot workload and improves mission performance and flight safety. G.R.

A82-40528 # **The YAH-64 empennage and tail rotor - A technical history.** R. W. Prouty and K. B. Amer (Hughes Helicopters, Inc., Culver City, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 247-261.

The development of a helicopter from drawing board to production line is still very much a learning process. The lessons learned in connection with the development of the Army YAH-64 Advanced Attack Helicopter should, therefore, be sufficiently valuable to future designers to warrant a detailed review. Attention is given to the changes to the empennage and tail rotor as the designers sought the best compromise between good performance and flying qualities on the one hand and low weight, low cost, and simplicity on the other. The considered helicopter has been developed primarily as a tank hunter and killer capable of flying and fighting at night or in bad weather. The primary weapons are wingmounted Hellfire guided missiles. The work discussed primarily deals with solutions to problems in the basic aircraft as they were discovered during its flight test. G.R.

A82-40529 # **Future helicopter cockpit design.** S. D. Roy (Westland Helicopters, Ltd., Yeovil, Somerset, England). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 262-273. 5 refs.

The influence of the use of electronic display systems on the helicopter cockpit is examined. Color CRT's are decidedly essential when proposed as complete replacements for conventional instruments, and two sizes of display are being considered (5 inches x 5 inches and 8 inches x 8 inches). Lighter displays, using flat panel technology, should be considered for the long term, but with careful consideration of pilot error due to misselection. Other technologies considered are data entry and extraction techniques, and direct voice control systems. The data technique is considered in terms of class of task, access, time constraints, and space availability, and a design approach for a voice system capable of continuous speech recognition is presented. The cockpit design implications of these modifications are considered. R.K.R.

A82-40530 # **Concept demonstration of automatic subsystem parameter monitoring.** M. S. Randolph (General Electric Co., Aerospace Control Systems Dept., Binghamton, NY) and R. V. Kurowsky (U.S. Army, Fort Monmouth, NY). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 274-286. Grant No. DAAK80-79-C-0270.

A feasibility demonstration model of an Electronic Master Monitor and Advisory Display System (EMMADS) has been developed as part of the Army's efforts to reduce aircrew workload, integrate cockpit instrumentation, and enhance aircraft maintenance capability. The feasibility demonstration hardware is considered along with aspects of system operation, taking into account the philosophy of operation, the types of operation, manually commanded operations, and fault commanded operations. Under a follow on development effort currently in progress, the capabilities of the current feasibility hardware will be expanded to include fault logic for all CH-47D model subsystems. G.R.

A82-40531 * # **Flight test evaluation of a video tracker for enhanced offshore airborne radar approach capability.** G. R. Clary (NASA, Ames Research Center, Moffett Field, CA) and P. G. Cooper (Cooper Avionics, Inc., Montara, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 287-297. 7 refs.

As a part of NASA's Rotorcraft All-Weather Operations Research Program, advanced airborne radar approach (ARA) concepts are being investigated. Since data from previous NASA/FAA flight tests showed significant ARA limitations, a research program was initiated at NASA Ames Research Center to determine the benefit that could be derived by automating certain radar functions and superimposing course display data on the radar display. To evaluate these concepts, a newly developed video tracking system which interfaces with weather radar was acquired. After the pilot designates a destination target, the system tracks the target video as it moves on the radar indicator. Using a small, efficient microprocessor, the autotracker presents valuable approach data on the radar screen and automatically adjusts the radar gain and tilt. Results of a limited flight test evaluation of the autotracker show that the course display concept, combined with automated gain and tilt functions, is effective for improving ARA's and reducing radar operator workload. (Author)

A82-40532 * # **Demonstration of radar reflector detection and ground clutter suppression using airborne weather and mapping radar.** D. J. Anderson, J. S. Bull (NASA, Ames Research Center, Moffett Field, CA), and J. P. Chisholm (Nevada, University, Reno, NV). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 298-305.

A navigation system which utilizes minimum ground-based equipment is especially advantageous to helicopters, which can make off-airport landings. Research has been conducted in the use of weather and mapping radar to detect large radar reflectors overland for navigation purposes. As initial studies have not been successful, investigations were conducted regarding a new concept for the detection of ground-based radar reflectors and eliminating ground clutter, using a device called an echo processor (EP). A description is presented of the problems associated with detecting radar reflectors overland, taking into account the EP concept and the results of ground- and flight-test investigations. The echo processor concept was successfully demonstrated in detecting radar reflectors overland in a high-clutter environment. A radar reflector target size of 55 dBsm was found to be adequate for detection in an urban environment. G.R.

A82-40533 # **Micro-heads-up display.** J. R. Goodman and H. W. Upton (Bell Helicopter Textron, Fort Worth, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 306-311.

A revolutionary microsized heads-up display (micro-HUD), which weighs only a few ounces and can be worn as a pair of conventional eyeglasses, is described. A microsize optical system makes the display possible. An advanced state-of-the-art visible light-emitting diode (VLED) array and a vibrating fiber ribbon generate the image. The system uses a microprocessor display generator that produces a dynamic image with 128 x 128 elements of resolution. This gives the micro-HUD the capability of presenting the same information as a standard heads-up display. Development of the custom-designed linear array of light-emitting diodes along with the specially fabricated fiber-optic scanner is also described. Results of laboratory and flight tests are discussed. Potential improvements such as higher resolution and multicolor versions of the display are described. Finally, the possible applications and future of the system is discussed. (Author)

A82-40534 # **Avionics systems for helicopter integration.** D. R. Nelson (Rockwell International Corp., Collins Government Avionics Div., Cedar Rapids, IA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 312-321.

Attention is given to a 'core system' which provides a common set of equipments that is, with appropriate software, applicable to a wide variety of helicopter missions. The basic core system is the core of the Coast Guard (USCG) HH-65A system. It has been proposed for civil and military helicopter programs with requirements ranging from covert 'behind-the-lines' operations to resupply of oil rigs. Particular elements of the core avionics systems include the Cockpit Management System (CMS), the Multi-purpose Video Display System, the Mission Computer, a dual redundant multiplex data bus control system, and a four-axis autopilot/flight director capable of hands-off flight in all regimes including transition to hover. Attention is given to system capability requirements, aspects of system functional allocation, the automatic flight control system, and the mission processor. G.R.

A82-40536 * # **NASA/FAA Helicopter ATC simulation investigation of RNAV/MLS instrument approaches.** L. L. Peach, Jr., L. Tobias, and H. Q. Lee (NASA, Ames Research Center, Moffett Field, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 322-336. 6 refs.

The NASA/FAA Helicopter Air Traffic Control (ATC) simulation investigations to determine the feasibility of simultaneous, independent instrument approach procedures for helicopters at major terminal areas, using Area Navigation/Microwave Landing System (RNAV/MLS) guidance, was conducted at several levels of helicopter display sophistication, up to that of a Cockpit Display of Traffic Information (CDTI) system. Test objectives included the determination of pilot acceptability and the tracking performance of the RNAV/MLS's noninterfering rotorcraft approach path structure, along with the evaluation of the effect on controller workload of multiroute structures combining conventional and rotorcraft approaches at various arrival rates and traffic separations. The utility of electronic area maps and CDTI displays was also investigated. Participating pilots flew 127 simulated instrument approaches in an ATC simulation laboratory. O.C.

A82-40537 # **Adaptation of pultrusion to the manufacture of helicopter components.** E. E. Blake (Bell Helicopter Textron, Fort Worth, TX) and N. J. Tessier (U.S. Army, Army Materials and Mechanics Research Center, Watertown, MA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 346-351.

A fabrication technique is described in which pultruded epoxy/glass stock with a complex crossection is postformed and cured to produce a curved UH-1 helicopter door track. During pultrusion, prepreg roving is overwrapped with adhesive prepreg glass cloth for transverse strength. The 'B' stage stock is postformed and autoclave cured in a glass/epoxy tool. The resulting door track retains the crossection of the pultrusion after developing the sweep and twist designed into the present aluminum part. Wear and load testing were performed on the composite door track along with an economic analysis comparing it with hand layup and the present aluminum track. The results demonstrate that it is feasible to produce complex helicopter components from pultrusions by means of postforming. (Author)

A82-40538 # **In-motion radiography of titanium spar tube welds.** R. J. Milne (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 352-358.

The application of titanium to a helicopter rotor blade spar was developed during the 1960's. However, the initially contemplated manufacturing method did not prove to be economical, and a new manufacturing procedure involving the use of a plasma arc welding technique was developed. The verification of weld integrity by means of a typical static X-ray test was found to be too time consuming, and the employment of in-motion radiography was considered. By using an in-motion radiographic system, it was possible to reduce significantly the time required to radiograph spar tube welds without sacrificing detail sensitivity. G.R.

A82-40539 # **Development of the Sea King composite main rotor blade.** R. Sanders (Westland Helicopters, Ltd., Yeovil, Somerset, England). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 359-370.

The Sea King composite main rotor blade has been designed to satisfy ruggedness requirements for the 1980's, and will soon be ready for flight testing. Composite materials with a replacable metal erosion shield have been chosen to improve the life of the blade, and a carbon and glass fiber mixture satisfies stiffness and weight requirements. A bolted root end design was chosen for this retrofit blade in order to ease automation, without degrading fatigue advantages of the composite construction. Technical problems and achievements encountered in the development process are discussed in terms of materials used, blade root design, manufacturing process, serviceability, and quality and safety control. A plant has been constructed to satisfy future production requirements, with an anticipated product availability date of late 1984. R.K.R.

A82-40540 # **Computer aided coordinate measuring systems.** J. W. Nastri (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 371-376.

Sikorsky's computer-aided inspection system and equipment utilized to assure that manufactured parts meet drawing tolerance specifications are discussed. An overview of the system is given, and the software is described, including the monitor console routine and commands and the language commands. The system's three coordinate measuring machines are discussed, and the part inspection methods are described in stepwise fashion. System benefits and time savings items are detailed, including quick and accurate measurement of parts difficult to inspect by conventional methods, significant reduction in inspection time, a consistent baseline that highlights variances, and the use of personnel with lower skill levels to effectively inspect critical parts. C.D.

A82-40541 # **Support of the HH-65A - The impact of advanced technology of VTOL systems upon existing product support.** R. E. Walkup (Aerospatiale Helicopter Corp., Grand Prairie, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 377-382.

The Coast Guard (USCG) will begin to replace the HH-52 Helicopters with the HH-65A in 1982. The HH-65A is equipped with a state-of-the-art digital avionics system. As the HH-52 has only vacuum tube avionics equipment, the new establishment of a complete support capability for solid state digital avionics will be necessary in connection with the introduction of the HH-65A. Other technological advances utilized in the HH-65A are related to turbine engines of modular design and the employment of composite materials in the aircraft structure. The HH-52 will continue in operation until all USCG stations will have received their HH-65A's. To provide support for simultaneous operation of both helicopters without an increase in support personnel will necessitate careful planning during the transitional period. Attention is given to the HH-65A avionics system, modular engine maintenance, aspects of corrosion control and the USCG mission, and the allocation and repair of spare components. G.R.

A82-40542 # **A roadmap toward a fatigue qualification process for modern technology helicopters.** S. T.-T. Chiu and R. W. Arden (U.S. Army, Directorate for Development and Qualification, St. Louis, MO). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 383-387. 30 refs.

The helicopter fatigue qualification process is critically reviewed to establish a roadmap, providing specific directions for a more efficient and unified qualification process. Specific improvements, various alternatives, and suggested unified approaches are discussed in terms of supporting rationales in the areas of coupon

The fault tolerance characteristics, transducer systems, high integrity software and reliability/maintainability of the projected full authority digital electronic control (FADEC) system are described, with attention to fault identification and flight crew notification procedures. The RB211-535C turbofan engine will be equipped with such a FADEC system. O.C.

A82-40985 # Advanced aerodynamic wing design for commercial transports - Review of a technology program in the Netherlands. N. Voogt (Fokker, Amsterdam, Netherlands) and J. W. Slooff (National Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1088-1098. 16 refs.

An aerodynamic technology development program is described, whose main objectives are the formulation and validation of a computational procedure for the aerodynamic design of high aspect ratio wings for the transonic regime of short-/medium range commercial aircraft, as well as the establishment of a transonic technology base. An inverse procedure has been formulated for the wing design task which allows the excercise of explicit control over wing geometry while approaching the target pressure distribution as closely as possible. Experience has been gained in relating target pressure distributions to off-design conditions through two-dimensional airfoil and three-dimensional wing studies, together with wind tunnel verifications that included the assessment of high Reynolds number characteristics. A wing-body configuration computational analysis capability for drag minimization studies has also been achieved by the program. O.C.

A82-40986 # Recent airfoil developments at DFVLR. H. Körner and G. Redeker (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Entwurfs-Aerodynamik, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1099-1114. 37 refs.

New airfoils may bring a substantial improvement in the aerodynamic efficiency of airborne vehicles. A number of new airfoils based on transonic and laminar concept have been designed and investigated at DFVLR. With theoretical design methods and facilities for experimental verification at hand, airfoils for subsonic transports, sail-planes, propellers, helicopter rotors and combat aircraft have been developed. (Author)

A82-40987 # Wing-tip jets aerodynamic performance. J. M. Wu, A. Vakili, and Z. L. Chen (Tennessee, University, Tullahoma, TN). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1115-1121. 32 refs. Contract No. F33615-81-K-3034.

This paper presents the preliminary study of wing-tip jets blowing techniques to achieve improvements in the wings aerodynamics performance. The feasibility of utilizing wing-tip jets to reduce the currently popular winglets has been conducted. The idea is to study the potential of replacing solid winglets by more flexible wing-tip jets to suit changing flight conditions. The wing-tip jets modify the flow-field near the wing tip and could achieve better aerodynamic performance of the wing. A first order calculation has been made to check the air-jet advantage versus the disadvantage in degrading the jet-engine performance by bleed-off of compressed air. The result indicate that the power (or thrust) saved is significant enough to encourage us to explore this new concept. Munk's minimum induced drag criterion has been extended to formulate the split branched wing-tips by utilizing multi-ports jet. Moreover, it is also conceived that an added jet swirling effect may induce a circulatory motion. The induced local downwash could alter the new wing-tip flow and thus suppress the main wing-tip-roll-up vortex. For this purpose, wind-tunnel tests with a half-wing model have been conducted to verify this concept. This is done by controlling the jet blowing direction and magnitude. (Author)

A82-40988 # An experimental investigation of leading-edge spanwise blowing. W. Su, M. Liu, B. Zhou, C. Qiu, and S. Xiong (Beijing Institute of Aeronautics and Astronautics, Beijing, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1122-1132. 13 refs.

Oil flow visualizations and pressure measurements on a 30-deg swept trapezoidal wing were conducted to investigate leading edge spanwise blowing (LE SWB), which is very near the leading edge and along it. The LE SWB can provide a higher maximum lift coefficient than conventional SWB. It can generate a more stable jet leading edge vortex above the inboard wing, and the outboard wing leading edge vortex can also be enhanced. The flow patterns of the wing with LE SWB are similar to those of a strake-wing configuration. (Author)

A82-40989 # Vortex formation over double-delta wings. U. Brennenstuhl and D. Hummel (Braunschweig, Technische Universität, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1133-1146. 20 refs.

Low speed wind tunnel tests have been carried out on a series of double-delta wings. The effects of variations in leading edge kink angle and in kink position have been investigated by mens of three-component pressure distribution and flow-field measurements, as well as by flow visualization at a Reynolds number value of 1.3 million. At small angles of attack two primary vortices exist on each side of the wing, originating from the apex and from the leading-edge kink. At moderate kink angles these two vortices join each other with increasing angle of attack. The junction process is analysed in detail and is intrepreted as a 'potential flow effect'. At very large angles of attack vortex breakdown occurs within the jointed vortices, which leads to the limitation of the aerodynamic coefficients. (Author)

A82-40990 # CATIA - A computer aided design and manufacturing tridimensional system. F. Bernard (Avions Marcel Dassault-Breguet Aviation, Suresnes, Hauts-de-Seine, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1147-1154.

A properietary computer graphics-aided, three-dimensional interactive application (CATIA) design system is described. CATIA employs approximately 100 graphics displays, which are used by some 500 persons engaged in the definition of aircraft structures, structural strength analyses, the kinematic analysis of mobile elements, aerodynamic calculations, the choice of tooling in the machining of aircraft elements, and the programming of robotics. CATIA covers these diverse fields with a single data base. After a description of salient aspects of the system's hardware and software, graphics examples are given of the definition of curves, surfaces, complex volumes, and analytical tasks. O.C.

A82-40991 # CDS-the designer's media, the analyst's model. D. P. Raymer (Rockwell International Corp., Los Angeles, CA) and S. K. Albrecht (Rockwell International Corp., Space Transportation and Systems Group, Downey, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1155-1163. 6 refs.

A proprietary Configuration Development System (CDS) is described which incorporates both a flexible interactive graphics program for the conceptual design of aerospace vehicles and a three-dimensional geometric data base which may be used by analysis programs. Experience to date with the CDS has demonstrated substantial productivity improvements, although, as noted by Sandusky (1978), such gains are more pronounced in the conduct of iteration procedures than in the reduction of throughtime. Nevertheless, optimal results are reached at an earlier stage of the design process. Graphics examples are given from CDS work on the FDL-5 and FDL-8 lifting body manned orbital vehicles. O.C.

A82-40992 * # Aircraft geometry verification with enhanced computer-generated displays. J. V. Cozzolongo (NASA, Ames Research Center, Moffett Field, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1163/a-1163/j. 11 refs.

A method for visual verification of aerodynamic geometries using computer-generated, color-shaded images is described. The mathematical models representing aircraft geometries are created for use in theoretical aerodynamic analyses and in computer-aided manufacturing. The aerodynamic shapes are defined using parametric bi-cubic splined patches. This mathematical representation is then used as input to an algorithm that generates a color-shaded image of the geometry. A discussion of the techniques used in the mathematical representation of the geometry and in the rendering of the color-shaded display is presented. The results include examples of color-shaded displays, which are contrasted with wire-frame-type displays. The examples also show the use of mapped surface pressures in terms of color-shaded images of V/STOL fighter-/attack aircraft and advanced turboprop aircraft. (Author)

A82-40993 # Technical and economic comparison of carbon fiber tape and woven fabric applications. G. Hilaire and G. Briens (Société Nationale Industrielle Aérospatiale, Laboratoire Central, Suresnes, Hauts-de-Seine, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1164-1172.

A comparative study is made of the structural performance characteristics of various types of carbon fiber fabrics and unidirectional filament prepreg tapes, in view of the relative equality of the importance, in recent applications of carbon fiber composites, of weight reduction, strength maximization, and reductions in manufacturing costs. The comparisons are between a 3000-filament (3 K) tow, T 300 carbon fiber, 5 H satin weave cloth weighing 285 g/sq m when dry, and a 3 K T 300 tape. Both are impregnated with 5208 resin and in that state represent 60 percent fiber volume composites. The performance characteristics considered are interlaminar shear, notched and unnotched tensile strength, and compressive strength. The consequences of each alternative for manufacturing are assessed for the cases of manual and automated lay-up, machining and cut trimming. O.C.

A82-40994 # **Application of composite materials and new design concepts for future transport aircraft.** R. H. Lange and J. W. Moore (Lockheed-Georgia Co., Marietta, GA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1173-1181. 30 refs.

The application of advanced technologies and the use of innovative aircraft design concepts show the potential for significant improvement in the fuel efficiency of future transport aircraft envisioned for operation in the mid to late-1990s. This paper reviews recent preliminary design system studies of transport aircraft featuring cost/benefit analyses of advanced technology and new vehicle design concepts. Emphasis is directed toward the use of graphite epoxy composite materials in the primary and secondary structures of transport aircraft. The data on aircraft design concepts include preliminary design studies of Advanced Civil/Military Aircraft (ACMA) aircraft and innovative configurations. The aircraft design parameters include cruise Mach numbers of 0.75 to 0.80, design payloads from 330,000 to 772,000 lbs, and range from 3,500 to 4,000 nautical miles. (Author)

A82-40995 # **Sliced disc design - A composite conform concept for a turbo engine axial compressor.** R. Kochendörfer (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Bauweisen- und Konstruktionsforschung, Stuttgart, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1182-1191. 5 refs.

For an 800 kW turbo engine demonstrator an axial compressor concept in composite technology was developed. The aim was a reduction of mass and moment of inertia compared to a titanium design. The geometry and the blade spacing required a single-blade attachment concept. To minimize the problems in the shear loading area, the 'compressor rotor' was divided into individual segments, made of aluminum alloy. Each of the Al-segments represents the root part of a B/Al blade. In the leading and trailing edge areas these segments are shrunk together by composite hoops, which also sustain the centrifugal loads. As long as the shrinkage pressure is present, the segmented disk exhibits a similar behavior as an unsliced disk. This sliced disk concept was successfully proof-tested in cold spin tests up to the design level of 47,600 rpm, corresponding to a maximum blade tip speed of 420 m/sec. (Author)

A82-40996 # **Comparison of HP turbine 'deep blade design' effects in turbofan engine gas generators with different bearing structure configurations.** D. Rist (München, Technische Universität, Munich, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1192-1202. 5 refs.

Two different types of gas generator bearing structure configurations have been investigated for a projected turbofan engine based on the deep blade design concept. Mechanical analyses are carried out for defined operation and load cases to estimate the required mass increase for the main components. It is shown that when the HP turbine rotor blade chord length is increased by 50%, the mass of the turbofan engine core increases by about 7 and 11% for the two configurations investigated. V.L.

A82-40998 # **Redundant control unit for an advanced multispool engine.** G. Dahl (Bodenseewerk Gerätetechnik GmbH, Überlingen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1214-1221.

The advantages and disadvantages of the use of digital technology for the control of modern multispool engines are discussed with reference to a newly developed redundant digital engine control unit. The controller structure is discussed with emphasis on software design and software verification methods. It is shown that the many advantages resulting from the introduction of digital technology, such as increased reliability, improved maintainability, and internal controller intelligence, make up for the inevitable disadvantages associated with the sampling process and computer delay time. V.L.

A82-40999 # **Test results of chordwise and spanwise blowing for low-speed lift augmentation.** G. A. Howell (General Dynamics Corp., Fort Worth, TX). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1222-1234. 11 refs.

Low-speed wind tunnel tests were conducted on a large-scale and a small-scale powered model of a STOL wing/canard concept with engines mounted over the wing. In a basic configuration, both models exhausted the entire nozzle-flow momentum over vectoring flaps. In an alternate configuration, both models exhausted a portion of the flow from spanwise nozzles in the outer nacelle wall to obtain wing-leading-edge vortex augmentation. Force and pressure data were obtained for the small-scale model powered by compressed air. Pressure and thermal data were obtained for the large-scale model powered by two turbojet engines. Chordwise blowing decreased the pressures over the entire wing upper surface and even on the canard at high angles of attack. The power-induced lift coefficients were moderate for chordwise blowing. Spanwise blowing increased the strength of the wing leading-edge vortex and reduced the pressure on the wing upper surface beneath the path of the vortex. (Author)

A82-41000 # **Aerodynamic research applications at Boeing.** A. L. Nagel (Boeing Commercial Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1235-1242. 24 refs.

This paper shows by several recent examples how aerodynamic research tools and methods have been applied to the design of subsonic commercial transport airplanes. Examples include wing modifications, nacelle integration, vortex generators, and cab design. Some recent high Reynolds number tests in the NASA 0.3-meter Transonic Cryogenic Tunnel are also described. (Author)

A82-41001 # **Wind tunnel test and aerodynamic analysis of three aeroelastically tailored wings.** W. W. Braymen, W. A. Rogers (General Dynamics Corp., Fort Worth, TX), and M. H. Shirk (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1243-1255. 11 refs. USAF-sponsored research.

Aeroelastic tailoring of composite lifting surfaces was validated in a program that involved design, fabrication, and transonic wind tunnel testing of three static aeroelastic wings in addition to a set of steel wings. Each aeroelastic wing had unique design objectives. The test featured aeroelastic shape documentation through the use of photogrammetry along with the simultaneous acquisition of forces and pressures. Highlights of the aerodynamic test results are presented, with emphasis placed on test-to-theory comparisons. The strong points as well as areas of needed improvement in the aerodynamic design methods are discussed. The investigation demonstrates that the design of composite lifting surfaces should include consideration of aerodynamic benefits available through tailoring. (Author)

A82-41002 * # **Upper Vortex Flap - A versatile surface for highly swept wings.** D. M. Rao (Vigyan Research Associates, Inc., Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1256-1266. 9 refs. NASA-supported research.

The Upper Vortex Flap (UVF) is a multipurpose surface concept to improve the subsonic aerodynamics of highly swept delta wings. Hinged along the leading edges and deployed from the wing upper surface, the UVF generates a vortex inboard on the wing in addition to the leading-edge vortex acting on the flap. The relative suction levels on the wing and on the flap surface, governed by the flap angle and angle of attack, lead to a variety of functional applications viz. lift increment, drag modulation, lift/drag improvement and roll augmentation. This paper presents wind tunnel force and pressure measurements on a 74-deg flat plate delta to define the UVF-related vortex effects and to assess its potential as a versatile control surface in different angle-of-attack regimes. (Author)

A82-41003 * # **Analytical study of vortex flaps on highly swept delta wings.** N. T. Frink (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1267-1275. 25 refs.

This paper highlights some current results from ongoing analytical studies of vortex flaps on highly swept delta wings. A brief discussion of the vortex flow analysis tools is given along with comparisons of the theories to vortex flap force and pressure data. Theoretical trends in surface pressure distribution for both angle-of-attack variation and flap deflection are correctly predicted by Free Vor-

the economic basis specified. Results indicate that shale oil fuels refineries are more capital intensive than a comparable size petroleum refinery. No attempt was made at optimization.
Author (GRA)

N82-28463# Suntech, Inc., Marcus Hook, Pa.
AN EXPLORATORY RESEARCH AND DEVELOPMENT PROGRAM LEADING TO SPECIFICATIONS FOR AVIATION TURBINE FUEL FROM WHOLE CRUDE SHALE OIL. PART 2: PROCESS VARIABLE ANALYSES AND LABORATORY SAMPLE PRODUCTION Interim Report, Jul. 1979 - 1 Nov. 1980
H. E. Reif, J. P. Schwedock, and A. Schneider Wright-Patterson AFB, Ohio AFWAL Sep. 1981 61 p refs 3 Vol.
(Contract F33615-78-C-2024; AF Proj. 2480)
(AD-A112682; AFWAL-TR-81-2087-Pt-2) Avail: NTIS HC A04/MF A01 CSCL 21/4

Pilot plant process data have been incorporated in three design bases for manufacturing military fuels from raw Occidental shale oil. Processing schemes for 90,000 BPCD refineries to maximize either JP-4, JP-8 or to produce JP-4 plus other military fuels are presented. The processing sequence comprises moderate severity hydrotreating, fractionation, anhydrous HCl extraction and hydrocarcking. Plant capacities and product yields were not optimized. Investments for the three refinery options considered are 1.5 to 2.0 times as much as a comparable size petroleum fuels refinery. At maximum JP-4 or JP-8 production the yields are about 87 and 53 volume % of total refinery energy input, respectively. Overall, refinery thermal efficiency is > or = 75%. Inspection data are presented for five samples of specification aviation turbine fuels prepared from pilot plant operations. GRA

N82-28464# Suntech, Inc., Marcus Hook, Pa.
AN EXPLORATORY RESEARCH AND DEVELOPMENT PROGRAM LEADING TO SPECIFICATIONS FOR AVIATION TURBINE FUEL FROM WHOLE CRUDE SHALE OIL. PART 3: PRODUCTION OF SPECIFICATION OF JP-4 FUEL FROM GEOKINETICS SHALE OIL Interim Report, 1 Jan. - 1 Apr. 1980
H. E. Reif, J. P. Schwedock, and A. Schneider Wright-Patterson AFB, Ohio AFWAL Oct. 1981 45 p refs 3 Vol.
(Contract F33615-78-C-2024; AF Proj. 2480)
(AD-A112683; AFWAL-TR-81-2087-Pt-3) Avail: NTIS HC A03/MF A01 CSCL 21/4

270 Barrels of specification JP-4 jet fuel were produced by hydrorefining 890 barrels of raw Geokinetics shale oil under severe operating conditions in a continuous process development unit. On a once thru basis the yield of JP-4 off the hydrotreater was about 35 volume % of the feed. Preliminary estimates of plant investments and economics indicate that for the combination severe hydrorefining and hydrocracking, an 85 volume % yield can be attained based on total refinery energy input. Capital investments and manufacturing costs do not appear to be excessive for a shale oil refinery. GRA

N82-28470# California Univ., Livermore. Lawrence Livermore Lab.
LABORATORY-SCALE SIMULATION OF UNDERGROUND COAL GASIFICATION: EXPERIMENT AND THEORY
J. R. Creighton and C. B. Thorsness 28 Aug. 1981 26 p refs Presented at the Western States Sect. Meeting of the Combust. Inst., Tempe, Ariz., 19-20 Oct. 1981
(Contract W-7405-eng-48)
(DE82-001083; UCRL-86473; CONF-811041-2) Avail: NTIS HC A03/MF A01

Laboratory-scale experiments simulating underground coal gasification are described. A 1 cm borehole is drilled through a block of coal which is cut to fit in a 55 gallon oil drum. Inlet gas may be air or oxygen/steam mixture at various ratios. The blocks are burned for a period of several hours at a prescribed flow schedule, with appropriate instrumentation. Gas quality is found to be relatively independent of coal type for the range of sub-bituminous coals tested. After the burn the blocks of coal are cut open to examine the cavity. A mathematical modeling effort supports these experiments. The models are restricted to pure carbon, to simplify the chemistry in the model. When plug flow is assumed in the cavity the model predicts reasonable cavity shape downstream, but an incorrect shape upstream. When aerodynamic flow, including viscosity and vortex formation, is calculated in the cavity reasonable cavity shapes are obtained.
DOE

N82-28486# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany). Materials and Processes Development Dept.
ADVANCED CASTING: TODAY AND TOMORROW
Dietmar Mietrach 1982 20 p refs Presented at AGARD Meeting on Adv. Casting Technol, Brussels, 4-9 Apr. 1982
Avail: NTIS HC A02/MF A01

The state of aluminum casting technology in terms of processes, component sizes, design and material-scientific data as well as mechanical characteristics was established during visits to foundries in the USA, Canada, France, Italy, Great Britain and the Federal Republic of Germany. Components of the primary structure of Tornado and ALPHA aircraft, (pylon, intake floor) classified according to the degree of difficulty during casting, were used to compare existing designs (riveted sheet metal and machined parts) and cast versions with regard to cost reduction and technical reliability. Visual inspection, dimensional checks, chemical composition analysis, penetrant tests, X-ray tests, metallographic investigations, and tensile tests were carried out. Cost savings of 25% and weight savings of 20% can be achieved by using castings. Author (ESA)

N82-28523# TRW Defense and Space Systems Group, Redondo Beach, Calif.
MULTIFUNCTION MULTIBAND AIRBORNE RADIO ARCHITECTURE STUDY Final Report, Apr. 1978 - Jan. 1980
L. N. Ma, S. K. Ogi, M. Y. Huang, L. L. Bodner, and P. Martin Wright-Patterson AFB, Ohio AFWAL Jan. 1982 379 p refs
(Contract F33615-77-C-1172; AF Proj. 2003)
(AD-A114427; AFWAL-TR-81-1113) Avail: NTIS HC A17/MF A01 CSCL 17/2

The demands of modern military avionic communication, radio navigation, and cooperative identification (CNI) equipment has been greatly expanded as the result of the need for antijam (AJ), low probability of intercept (LPI), higher navigation accuracy, and increased volume of information transfer. These demands are verified in programs such as GPS, JTIDS, SEEK TALK, SINCGARS and AFSAT I and II. The cost of this additional capability has severely hampered the ability of the Government to procure new CNI systems and equipment with desired performance capabilities. The problem is further compounded by the lack of available space in the tactical aircraft, the transition of new equipment into the inventory, and the retention of many current systems. The multifunction multiband airborne radio system (MFBARS) program is formulated to explore the feasibility of producing a modern CNI system at an affordable life cycle cost (LCC) and within real estate requirements. A cost effective system approach was developed that revolved around high technology RF-LSI analog components that are in the development stage, high speed digital pre-processor elements and a programmable signal processor all under control of a host processor configuration. This design trades the ultimate gain in volume, weight and life cycle cost against a reasonable risk for the mid 1980's development. Author (GRA)

N82-28552# Boeing Aerospace Co., Seattle, Wash.
FEASIBILITY STUDY OF A 270V dc FLAT CABLE AIRCRAFT ELECTRICAL POWER DISTRIBUTED SYSTEM Final Report, Dec. 1980 - Jan. 1982
M. J. Musga and R. J. Rinehart Jan. 1982 272 p refs
(Contract N62269-81-C-0231)
(AD-A114026; D182-10816-1; NADC-82023-60) Avail: NTIS HC A12/MF A01 CSCL 10/2

This report documents the efforts of a one man-year feasibility study to evaluate the usage of flat conductors in place of conventional round wires for a 270 volt direct current aircraft power distribution system. This study consisted of designing electrically equivalent power distribution harnesses in flat conductor configurations for a currently operational military aircraft. Harness designs were established for installation in aircraft airframes which are: (1) All metal, or (2) All composite, or (3) a mixture of both. Flat cables have greater surface areas for heat transfer allowing higher current densities and therefore lighter weight conductors, than with round wires. Flat cables are less susceptible to electromagnetic effects. However, these positive factors are partially offset by installation and maintenance difficulties. This study concludes that the extent of these difficulties can be adequately limited with appropriate modification to present installation and maintenance practices. A comparative analysis of the flat and the round conductor power distribution harnesses was made for weight, cost, maintenance and reliability. The knowledge gained from the design and comparative analysis phases was used to generate design criteria for flat power cable harnesses and to identify and prioritize flat cable harness components and associated production tooling which require development. GRA

N82-28571# Aeronautical Research Inst. of Sweden, Stockholm.
MEASURING THE FLOW PROPERTIES OF SLOTTED TEST-SECTION WALLS
Sune B. Berndt May 1982 15 p refs
(FFA-135) Avail: NTIS HC A02/MF A01

By measuring pressure distributions at two levels near a slotted wall it is possible to deduce simultaneous values of normal and longitudinal velocities. Such measurements require, for their proper interpretation, a basic understanding of the flow in the neighborhood of the wall. An analysis of the problems involved is provided. Author

N82-28624# Rose Engineering and Research, Inc., Incline Village, Nev.
NEARFIELD AERODYNAMICS AND OPTICAL PROPAGATION CHARACTERISTICS OF A LARGE-SCALE TURRET MODEL Final Report
William C. Rose, James E. Craig (Spectron Development Lab., Inc.), and K. R. Raman (Raman Aeronautics, Inc.) Kirtland AFB, N. Mex. AFWL Feb. 1982 100 p refs
(Contract F29601-79-C-0011; AF Proj. 317J)
(AD-A113910; AFWL-TR-81-28) Avail: NTIS HC A05/MF A01 CSCL 20/6

Measurements of the unsteady flow field affecting optical propagation quality have been made with both aerodynamic and direct optical instrumentation. Properties affecting degradation of coherent radiation beams propagated from within the turret have been investigated. These properties include both the magnitude and scale sizes of the fluctuating index-of-refraction field present in the turbulent shear layers and separation regions of the turret flow field. Direct optical degradation information was obtained by holographic interferometry and quantified through techniques presented here. Aerodynamic measurements were made with hot-wire anemometry and multiple-port probes. Comparisons between the aerodynamically and optically deduced data are presented. These data can be used directly to estimate trends in expected loss of optical quality of a coherent beam for various flight speeds, altitudes, wavelengths and azimuthal turret angles. More data are now available for estimating the effects of unsteady aerodynamic flow fields on optical propagation quality. Data were obtained for Reynolds numbers near those occurring at full-scale flight conditions over a range of Mach number from 0.55 to 0.75. Investigation results generally agree with those obtained previously on smaller scale models and indicate that severe optical degradation can be present at aft-looking azimuth angles. Author (GRA)

N82-28643*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RELIABILITY MODEL FOR PLANETARY GEAR
Michael Savage (Akron Univ.), Charles A. Paridon (Hewlett Packard Co., Sunnyvale, California), and John J. Coy (Army Aviation Research and Development Command, Cleveland, Ohio) 1982 22 p refs Proposed for Presentation at Design Engr. Tech. Conf., Washington, D.C., 12-15 Sep. 1982; sponsored by ASME Prepared in cooperation with Army Aviation Research and Development Command
(NASA-TM-82859; NAS 1.15:82859; AVRADCOM-TR-82-C-6) Avail: NTIS HC A02/MF A01 CSCL 13I

A reliability model is presented for planetary gear trains in which the ring gear is fixed, the Sun gear is the input, and the planet arm is the output. The input and output shafts are coaxial and the input and output torques are assumed to be coaxial with these shafts. Thrust and side loading are neglected. This type of gear train is commonly used in main rotor transmissions for helicopters and in other applications which require high reductions in speed. The reliability model is based on the Weibull distribution of the individual reliabilities of the transmission components. The transmission's basic dynamic capacity is defined as the input torque which may be applied for one million input rotations of the Sun gear. Load and life are related by a power law. The load life exponent and basic dynamic capacity are developed as functions of the component capacities. Author

N82-28644*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio
ADVANCES IN HIGH-SPEED ROLLING-ELEMENT BEARINGS
Erwin V. Zaretsky 1982 29 p refs Presented at the 18th Ann. Israel Conf. on Mechan. Engr., Haifa, Israel, 12-14 Jul. 1982; sponsored by Technion - Israel Inst. of Tech.
(NASA-TM-82910; E-1295; NAS 1.15:82910) Avail: NTIS HC A03/MF A01 CSCL 13I

Aircraft engine and transmission rolling-element bearing state-of-the-art is summarized. Author

N82-28676# Alabama Univ., Huntsville. Dept. of Mechanical Engineering.
RECENT DEVELOPMENTS IN HYGROTHERMOVISCOELASTIC ANALYSIS OF COMPOSITES
T. J. Chung *In* Shock and Vibration Information Center The Shock and Vibration Digest Vol. 14, No. 4 Apr. 1982 p 33-40 refs (For primary document see N82-28673 19-39)
Avail: SVIC, Code 5804, Naval Research Lab., Washington, D.C. 20375; $20.00/set CSCL 20/11

Constitutive theories of hygrothermomechanical behavior of viscoelastic composites are reviewed. Author

N82-28686# National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.
PREDICTION OF FATIGUE CRACK GROWTH RATES UNDER VARIABLE LOADING USING A SIMPLE CRACK CLOSURE MODEL
A. U. deKoning and H. H. vanderLinden Apr. 1980 45 p refs Presented at 11th ICAF Symp., Noordwijkerhout, Netherlands, 20-22 May 1981
(Contracts NIVR-1777; NIVR-1822; NIVR-1823)
(NLR-MP-81023-U) Avail: NTIS HC A03/MF A01

A model which predicts fatigue crack growth rates in aluminum alloys subjected to flight service loading is presented. The model is based on an approximate description of the crack opening behavior and was applied successfully in an analysis of effects of crack growth acceleration and retardation observed experimentally under variable amplitude loading. The model describes effects of the plane strain to plane stress transition and of relatively high overloads on crack growth rate of the crack. Author (ESA)

N82-28690*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.
BASELINE MONITORING USING AIRCRAFT LASER RANGING
W. B. Krabill, F. E. Hoge, and C. F. Martin Jun. 1982 28 p refs
(NASA-TM-73298; NAS 1.15:73298) Avail: NTIS HC A03/MF A01 CSCL 08B

The use of aircraft laser ranging for the determination of baselines between ground based retroreflectors was investigated via simulations and with tests at Wallops Flight Center using the Airborne Oceanographic Lidar (AOL) on the Wallops C-54 aircraft ranging to a reflector array deployed around one of the Wallops runways. The aircraft altitude and reflector spacing were chosen on the basis of scaled down modeling of spacecraft tracking from 1000 km of reflectors separated by some 52 km, or of high altitude (10 km) aircraft tracking of reflectors separated by some 500 m. Aircraft altitudes flown for different passes across the runway reflector array varied from 800 m to 1350 m, with 32 reflectors deployed over an approximately 300 m x 500 m ground pattern. The AOL transmitted 400 pulses/sec with a scan rate of 5/sec in a near circular pattern, so that the majority of the pulses were reflected by the runway surface or its environs rather than by retroreflectors. The return pulse characteristics clearly showed the high reflectivity of portions of the runway, with several returns indistinguishable in amplitude from reflector returns. For each pass across the reflector field, typically six to ten reflector hits were identified, consistent with that predicted by simulations and the observed transmitted elliptical pulse size. Author

N82-28715*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SCANNER IMAGING SYSTEMS, AIRCRAFT
Stephen G. Ungar *In* JPL Proc. of the NASA Workshop on Registration and Rectification 1 Jun. 1982 p 138-152 (For primary document see N82-28698 19-43)
Avail: NTIS HC A23/MF A01 CSCL 08B

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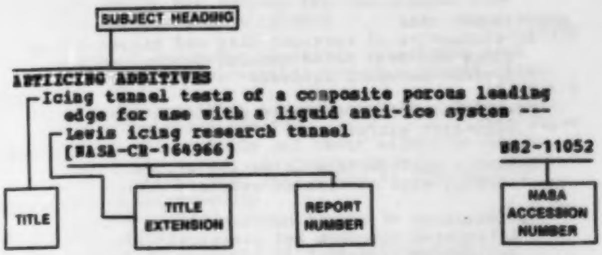
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maximum lift coefficient and lift to drag ratio at high angles of attack, a broader range of high lift coefficients, and less abrupt stall characteristics. (Author)

A82-39102 * # Dynamic stability of flexible forward swept wing aircraft. T. A. Weisshaar and T. A. Zeiler (Purdue University, West Lafayette, IN). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1325.* 12 p. 25 refs. Grant No. NAG1-157.

This paper describes potential vehicle instability modes for forward swept wing aircraft and other divergence prone aircraft. Examples show that either body-freedom flutter or aircraft aeroelastic divergence may occur depending upon the airplane planform geometry and mass distribution. These vehicle instabilities may occur at speeds very different than the clamped wing aeroelastic divergence speed. (Author)

A82-39103 # Optimal three-dimensional turning performance of supersonic aircraft. C.-F. Lin (Wisconsin, University, Madison, WI). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1326.* 10 p. 17 refs.

This paper discusses real-time, on-line three-dimensional turning maneuvers of supersonic aircraft with emphasis on the problems of minimum-time and minimum-fuel turns. The minimum-time problem is completely solved. For the minimum-fuel case, the problem of minimum-fuel turn to a line is solved while suggestions for further research on minimum-fuel turn in three dimensions are presented. Two mathematical models of the aerodynamic and engine characteristics are designed to facilitate the application of the optimal control theory to analyze a wide range of flight programs. One such model is a typical lightweight, high thrust-to-weight ratio fighter used for the computation of minimum-time problem. The other is a rocket-powered aircraft used for the computation of the minimum-fuel problem. (Author)

A82-39105 # The correlation of flight test and analytic M-on-N air combat exchange ratios. D. S. Hague (Aerophysics Research Corp., Bellevue, WA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1328.* 6 p. Contract No. F33615-80-C-3003.

This paper compares analytic and flight test predictions of Many-on-Many air combat performance capability. It is shown that stochastic effects dominate air combat encounter outcomes and that air combat performance estimates should be based on a large sample of encounters. Overall exchange ratios, the number of red losses per blue loss, predicted by flight test and analysis are within 5% of each other. Trends in exchange ratio with force size obtained by the two methods are also similar. Finally, it is shown that air combat performance is sensitive to both force size ratio and the total number of aircraft engaged and that differences in performance between aircraft types may diminish with increasing aircraft numbers. (Author)

A82-39106 * # Unique flight characteristics of the AD-1 oblique-wing research airplane. R. E. Curry and A. G. Sim (NASA, Flight Research Center, Edwards, CA). *American Institute of Aeronautics and Astronautics. Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1329.* 8 p. 9 refs.

Flight characteristics associated with an oblique-wing airplane have been studied with limited scope and complexity using the AD-1 research vehicle. The AD-1 is a low-speed, low-cost, manned airplane with an aeroelastically tailored wing that can be pivoted 0 to 60 deg asymmetrically. Results of the flight tests include aerodynamic parameter extraction, verification of the aeroelastic wing design criteria, trim requirements, stall characteristics, and an evaluation of the handling qualities and basic control system requirements. Some of the unique characteristics of these results that pertain to the oblique-wing design are presented. (Author)

A82-39107 * # Analysis of in-trail following dynamics of CDTI-equipped aircraft. J. A. Sorensen and T. Goka (Analytical Mechanics Associates, Inc., Mountain View, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1330.* 10 p. 14 refs. Contract No. NAS1-16135.

In connection with the necessity to provide greater terminal area capacity, attention is given to approaches in which the required increase in capacity will be obtained by making use of more automation and by involving the pilot to a larger degree in the air traffic control (ATC) process. It was recommended that NASA should make extensive use of its research aircraft and cockpit simulators to assist the FAA in examining the capabilities and limitations of cockpit displays of traffic information (CDTI). A program was organized which utilizes FAA ATC (ground-based) simulators and NASA aircraft and associated cockpit simulators in a research project which explores applications of the CDTI system. The present investigation is concerned with several questions related to the CDTI-based terminal area traffic tactical control concepts. Attention is given to longitudinal separation criteria, a longitudinal following model, longitudinal capture, combined longitudinal/vertical control, and lateral control. G.R.

A82-39117 * # Flight dynamics of rotorcraft in steep high-g turns. R. T. N. Chen (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1345.* 16 p. 21 refs.

An analyticl procedure developed to permit a systematic examination of rotorcraft flight dynamics in steep high-g turns is presented. The procedure is used in a numerical investigation of a tilt-rotor aircraft and three single-rotor helicopters that have different types of main rotor systems. The results indicate (1) that strong coupling in longitudinal and lateral-directional motions exists for these rotorcraft in high-g turns; (2) that for single-rotor helicopters, the direction of turn has a significant influence on flight dynamics; and (3) that a stability and control augmentation system that is designed on the basis of standard small-disturbance equations of motion from steady straight and level flight and that otherwise performs satisfactorily in operations near 1 g, becomes significantly degraded in steep turning flight. (Author)

A82-39118 * # A ground-simulation investigation of helicopter decelerating instrument approaches. J. V. Lebacqz (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1346.* 11 p. 24 refs.

In connection with the expansion of civil helicopter operations in the current era, the effect of helicopter flight and control characteristics on the flying qualities for instrument flight rules (IFR) flight have become a factor of concern, and a research program has been initiated to investigate IFR certification criteria. A description is presented of an experiment which is the sixth in a series of ground- and flight-simulation investigations. This piloted-simulator experiment was conducted to examine the influence of stability-control augmentation, display information format, and approach-task effects on helicopter flying qualities for terminal-area operations incorporating a deceleration in instrument meteorological conditions. Simulated test configurations were evaluated for precision approaches with an instrument deceleration from 60 to about 15 knots in both calm air and simulated moderate turbulence and wind shear. G.R.

A82-39119 # Maneuver stability of a vehicle with a towed body. B. L. Nagabhushan (Goodyear Aerospace Corp., Defense Systems Div., Akron, OH) and E. M. Cliff (Virginia Polytechnic Institute and State University, Blacksburg, VA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1347.* 9 p. 8 refs. Research supported by the Virginia Polytechnic Institute and State University.

Nonlinear equations of motion are derived and subsequently linearized to describe the coupled dynamics of a vehicle with a towed body. Using these stability of an aircraft with a sling load has been determined for simple maneuvers where the vehicle is maintaining a straight and level flight path or performing a steady turn. The effect of orienting the corresponding thrust vector of the aircraft on the system stability is examined by considering the thrust (1) fixed in inertial space, (2) fixed with respect to the vehicle relative wind. Typically, towing cable length, towed body to vehicle mass ratio, and load factor in a turn have been found to affect stability of the aircraft and its sling load. These results are illustrated here with an example of a maneuvering helicopter with a sling load. (Author)

A82-39120 # Application of multivariable model following method to flight controller. K. Kanai (Defense Academy, Yokosuka, Japan), P. N. Nikiforuk (Saskatchewan, University, Saskatoon, Canada), S. Uchikado, and N. Hori. *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1349.* 7 p.

The present investigation is concerned with the problem of designing a model following control system for a multivariable linear plant, taking into account an application to the synthesis of a multiinput multioutput flight controller. Attention is given to a problem statement, the construction of a model following system via state feedback plus input dynamics, and the synthesis of a Control Configured Vehicle (CCV) controller. It is found that the construction of a model following system via state feedback with input dynamics compensator becomes possible even for the case of the singular control matrix. Using the proposed method, CCV modes, such as desirable precision maneuvers, independent velocity, and altitude changes, are achieved. G.R.

A82-39121 # Design and analysis of a multivariable control system for a CCV-type fighter aircraft. D. B. Ridgely, S. S. Banda (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH), and J. T. Silverthorn (USAF, Wright Aeronautical Laboratories and Institute of Technology, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1350.* 8 p. 10 refs.

The theory of high-gain, error-actuated feedback control was applied to the design of a longitudinal decoupling flight control system for an advanced fighter aircraft. Because of the structure of the system, measurement variables different from the outputs are necessary to apply this method. This paper describes how entire eigenstructure assignment can be used to determine appropriate measurement equations by assigning their corresponding transmission zeros. A singular value decomposition was used to choose the eigenvectors from their permissible subspaces. Proper selection of eigenvalues/eigenvectors was shown to be crucial to the successful application of this theory. (Author)

A82-39122 # **An MLS with computer aided landing approach.** M. N. Wagdi (Riyadh, University, Riyadh, Saudi Arabia). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1352.* 9 p. 5 refs.

A computerized landing approach path definition that utilizes the MLS radio navigational aid is presented. An algorithm is developed which identifies the minimum time path that connects the initial MLS engage point to the touch down point. Such path is generally composed of two segments. The first segment begins at the MLS engage point and ends at the beginning of the straight glide slope. The second segment starts at the beginning of the straight glide slope and ends at the touch down point. The MLS azimuth and elevation and DME signals are processed by an on board computer that displays on a CRT the aircraft position relative to the ideal position of the optimal computed landing pattern. The present technique allows the initiation of landing approaches from wide range of headings and elevations, thus resulting into more efficient terminal area traffic control. Also it is suitable for low visibility landing approaches. (Author)

A82-39123 # **Perspectives of the flying qualities specification.** S. G. Fuller and D. J. Moorhouse (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1354.* 9 p. 24 refs.

A combined flying qualities and flight controls conference was held to discuss proposed changes to MIL-F-8785C and MIL-F-9490D. These changes were primarily due to the new MIL-Standard and Handbook format being developed. A summary is presented of the formal and informal presentations and the discussions related to flying qualities topics. Included are organization of the requirements, equivalent systems, alternate criteria, atmospheric disturbance effects and the relationship of the flying qualities and flight control system requirements. In recent years the flying qualities specification has lost credibility. Results of this credibility loss and the solutions for the future are discussed. (Author)

A82-39124 # **Guidance for the use of equivalent systems with MIL-F-8785C.** T. A. Gentry (USAF, Flight Dynamic Laboratory, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1355.* 11 p. 20 refs.

It is pointed out that handling qualities requirements for military conventional aircraft are specified in MIL-F-8785C, Military Specifications - Flying Qualities of Piloted Airplanes'. This specification places requirements on the characteristics of the overall aircraft system as perceived by the pilot during piloted control. An application of the specification in the case of conventional aircraft presents no difficulties. However, there may be problems with more complex flight control systems. In order to compare future augmented aircraft systems to MIL-F-8785C the equivalent system approach has been suggested. The present investigation provides guidance in the application of the equivalent system approach to augmented aircraft longitudinal dynamics and similar application to lateral-directional dynamics where appropriate. The equivalent of an augmented system is actually produced by matching the actual high-order system with an equivalent low-order system. G.R.

A82-39125 * # **A modern approach to pilot/vehicle analysis and the Neal-Smith criteria.** B. J. Bacon and D. K. Schmidt (Purdue University, West Lafayette, IN). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1357.* 10 p. Grant No. NAG4-1.

The present investigation is concerned with the development of a better pilot modelling technique via optimal control theory, taking into account concepts concerning 'pilot rating' considered by Neal and Smith (1970). The investigation conducted by Neal and Smith had the objective to provide data on the effects of Flight Control System dynamics and to develop a design criterion capable of pinpointing pilot problem areas encountered in performing a given task. Neal and Smith devised a 'pilot-in-the-loop' analysis capable of showing problem areas in pitch attitude tracking. Unfortunately the employed method has some drawbacks. The current investigation attempts, therefore, to provide an alternate approach which makes use of an optimal-control pilot model. An optimal control model (OCM) had been discussed by Kleinman et al. (1970). It is shown that the alternate approach, based on the OCM, offers some distinct advantages. G.R.

A82-39126 # **Analysis and wind tunnel tests of a probe used to sense altitude through measurement of static pressure.** K. D. Tillotson (General Dynamics Corp., Pomona, CA) and A. E. Fuhs (U.S. Naval Postgraduate School, Monterey, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1361.* 10 p. 8 refs. Navy-supported research.

A static pressure probe was tested to determine the feasibility of using the probe, as an integral part of a missile nose, to sense missile altitude. Experiments were conducted at Mach 2.0 and at Mach 1.81. At Mach 2.0, the static pressure probe will perform within altitude specifications of 25,000 feet + or - 2,000 feet at angles-of-attack ranging from - 6 to + 6 degrees. At Mach 2.0, within an angle-of-attack ranging from 0 to 6 degrees, the probe will measure free stream static pressure within 4 percent; a 4 percent error in measurement is equivalent to an altitude error of 900 feet. The missile nose shock will remain downstream of the probe pressure ports for flight Mach numbers above 1.5. (Author)

A82-39129 # **Use of rotary balance and forced oscillation test data in six degrees of freedom simulation.** J. Kalviste (Northrop Corp., Hawthorne, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1364.* 11 p.

New analysis techniques are presented that will blend the data from the rotary balance test, forced oscillation test and computed dynamic derivatives for a nonlinear 6 DOF simulation. A component of the rotation vector about the velocity vector is used with the rotary balance test data. The other components of the rotation vector are used with the forced oscillation test data and computed derivatives. The problem of separating the pure rotational and acceleration terms of the forced oscillation test data is resolved. Recommendations are made in the data reduction procedure for forced oscillation testing to make the results more usable for aircraft motion simulation. (Author)

A82-39132 # **Close-coupled canard-wing vortex interaction and Reynolds stress acquisition.** W. Calarese (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1366.* 12 p. 7 refs.

The present experiment investigates the interaction of canard and wing vortices and their effect on the lifting wing's flow field turbulence and Reynolds stresses. Spanwise wing blowing was used to enhance the leading edge vortex and alter the vortex trajectory in an effort to keep it locked to the wing's leading edge for lift enhancement. The turbulence intensity and Reynolds stresses were obtained by using hot film anemometers. Air blowing enhances the circulation over the wing, preventing extensive flow separation. Reynolds stresses, mean velocity, and turbulence intensity values illustrate the vortex structure. (Author)

A82-39134 # **Analysis of an airplane windshield anti-icing system.** P. Ross (Ross Aviation Associates, Sedgwick, KS). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1372.* 8 p.

This report documents the analysis methods developed to predict the performance of the windshield hot air anti-icing system on a business jet airplane. Flight data gathered from dry air and natural icing tests are used to develop and verify the accuracy of a procedure that will predict the windshield surface temperature for either wet or dry air. It is shown that windshield surface temperatures can be estimated to an accuracy of + or - 5% for a wide range of aircraft conditions. It is demonstrated that the method is somewhat conservative for all conditions. (Author)

A82-39135 * # **NASA Dryden's experience in parameter estimation and its uses in flight test.** K. W. Iliff and R. E. Maine (NASA, Flight Research Center, Edwards, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1373.* 16 p. 17 refs.

An explanation of the parameter estimation method used at the Dryden Flight Research Facility is presented, and an overview is provided of experience related to the employment of this method, taking into account the utilization of this experience in flight tests. According to a definition of the aircraft parameter estimation problem, the system investigated is asumed to be modeled by a set of dynamic equations containing unknown parameters. To determine the values of the unknown parameters, the system is excited by a suitable input, and the input and actual system response are measured. The values of the unknown parameters are then inferred, based on the requirement that the model response to the given input match the actual system response. Examples of parameter estimation in flight test are discussed, giving attention to the F-14 fighter, the HiMAT (high maneuverable aircraft technology) vehicle, and the Space Shuttle. G.R.

A82-39141 * # **Effects of vortex breakdown on longitudinal and lateral-directional aerodynamics of slender wings by the suction analogy.** C. E. Lan and C.-H. Hsu (Kansas, University, Lawrence, KS). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th,* S-N data utilization, S-N curve reduction factor and curve shape, cycle counting method, structure classification, fatigue test requirement and in-service monitoring. Current status and an overview are presented of a parallel AGARD effort to compile a 'Helicopter Fatigue Design Guide'. (Author)

A82-40543 # **Optimum structural design.** R. L. Bennett (Bell Helicopter Textron, Fort Worth, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 398-407. 12 refs.

Four typical helicopter engineering analyses have been combined with a nonlinear programming (NLP) algorithm to produce closed loop design-oriented analyses. The resulting models are shown to be very effective in supporting detailed design by eliminating the existing external man-in-the-loop iterative process. The nonlinear programming problem and how it relates to the engineering design process is described, along with typical NLP algorithms and how they are combined with conventional engineering analyses. C.D.

A82-40544 # **Design and fabrication of a composite rear fuselage for the UH-60 /Black Hawk/.** D. G. Orlino (U.S. Army, Applied Technology Laboratory, Fort Eustis, VA) and B. F. Kay (United Technologies Corp., Sikorsky Aircraft Div., Stratford, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 408-416.

The primary objective of the program to design a composite rear fuselage (CRF) is fabrication cost reduction, and other concerns are a 10% weight savings, improved reliability and maintainability, and increased ballistic survivability. The CRF design comprises a stiffened skin, with five major panels, bulkheads, and frames. A modular repair concept resulted in reduced life-cycle cost, introducing reliability and maintainability into the design. In order to prevent fuel fires on impact with high explosive incendiary projectiles, rigid ballistic foam was used to fill the fuel cell. Visual inspection as well as destructive tests were completed, and necessary tooling changes were implemented. Objectives being met, a full-scale static test article is being produced. R.K.R.

A82-40545 # **In-plane shear test of thin panels.** G. L. Farley and D. J. Baker (U.S. Army, Structures Laboratory, Hampton, VA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 417-425. 5 refs.

Efficient application of thin gage composite materials to helicopter fuselage structures necessitates that the materials be designed to operate at loads several times higher than initial buckling load. Methods are required to accurately measure and predict the response of thin gage composites when subjected to these loads. This paper presents the results of an analytical and experimental study of the behavior of thin gage composite panels subjected to in-plane shear loads. Finite element stress analyses were used to aid in the design of an improved shear fixture that minimizes adverse corner stresses and tearing and crimping failure modes characteristic of commonly used shear fixtures. Tests of thick buckle resistant aluminum panels and thin aluminum and composite panels were conducted to verify the fixture design. Results of finite element stress and buckling analyses and diagonal tension theory predictions are presented. Correlation of experimental data with analysis indicated that diagonal tension theory can be used to predict the load-strain response of thin composite panels. (Author)

A82-40546 # **A summary of weight savings data for composite VSTOL structure.** R. L. Foye (U.S. Army, Research and Technology Laboratory, Moffett Field, CA) and R. Arden (U.S. Army, Aviation Research and Development Command, St. Louis, MO). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 426-437. 96 refs.

This paper summarizes the weight savings that have been obtained over the last ten years through the application of advanced composite materials to each of the major structural weight groups of a VSTOL airframe. The data has been drawn from journal articles, published papers, R&D reports, and personal communications. Helicopter, VSTOL, and fixed wing applications of composites have been included. The data is not comprehensive but represents a significant sampling of all recent composite airframe designs. (Author)

A82-40547 # **Structural design of a crashworthy landing gear for the AH-64 Attack Helicopter.** J. M. McDermott (Hughes Helicopters, Inc., Culver City, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 438-450.

Requirements for the design of a landing gear for helicopters are considered. In the case of the AH-64 Attack Helicopter, an additional consideration is related to air transportability requirements of the helicopter, necessitating a kneeling requirement in the landing gear configuration in order to reduce the height of the helicopter to fit into the cabin of the cargo aircraft transporting it. This kneeling requirement was also utilized to provide a high degree of crash protection. According to specification, protection of the crew has to be provided for conditions involving a vertical impact velocity of as high as 42 ft/sec. In order to meet this requirement, it was necessary to use the landing gear to absorb as high a proportion of the vertical kinetic energy as was feasible before the fuselage contacted the ground. Attention is given to the configuration of the landing gear for the AH-64, the design criteria, details of impact energy absorption, the integration of the landing gear into the airframe, and static structural testing. G.R.

A82-40548 # **Ringfin augmentation effects.** H. E. Lamont (Bell Helicopter Textron, Fort Worth, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 451-460.

The ringfin concept has been developed since 1975 as a potential remedy for a number of concerns experienced in connection with the operation of single main rotor/tail rotor helicopters. This concept involves the use of a thrust ring around the tail rotor. The ring acts as fin, and generates lift force (antitorque). The present investigation is concerned with the measured augmentation effects in ground running, in hover and side flight, in forward translation, and mixing of the rotor wakes. The investigation shows that under static thrust conditions the tail rotor flow generates an induced positive force on the ring. The rotor tip vortices are dissipated with downstream flow motion, and an expanding slowed-velocity wake is created. G.R.

A82-40549 * # **Performance of the Rotor Systems Research Aircraft calibrated rotor loads measurement system.** C. W. Acree, Jr. (NASA, Ames Research Center, Moffett Field, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 461-473. 6 refs.

The compound Rotor Systems Research Aircraft (RSRA) is designed to make high accuracy, simultaneous measurements of all rotor forces and moments in flight. Physical calibration of the rotor force- and moment-measurement system when installed in the aircraft is required to account for any errors and to ensure that measurement system accuracy is traceable to the National Bureau of Standards. The first static calibration and associated analysis has been completed with good results. Hysteresis was a potential cause of static calibration errors, but was found to be negligible in flight, and analytical methods have been devised to eliminate its effects on calibration data. Flight tests confirmed that the calibrated rotor loads measurement system performs as expected in flight, and that it can dependably make direct measurements of fuselage vertical drag in hover. (Author)

A82-40550 # **Error minimization in ground vibration testing.** E. J. Nagy (Kaman Aerospace Corp., Bloomfield, CT). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 474-480. 5 refs.

The Ground Vibration Testing (GVT) of a U.S. Army AH-1G helicopter airframe has been successfully completed. New methods have been developed to identify and minimize the errors in GVT. These methods can be utilized in future programs. The new approaches make effective use of a digital signal analyzer as a 'working tool'. Examples are presented to demonstrate the use of the digital signal analyzer in connection with a number of applications. Attention is given to methods for the determination of the linear range, the location and identification of structural modes, the selection of narrow band sweeps, the selection of driving points, the local mode effect, driving point acceleration mobility checks for positive imaginary components, strain mobilities, the power method, and the number of averages. G.R.

A82-40551 # **Results of the AH-64 Structural Demonstration.** K. R. Spreuer (Hughes Helicopters, Inc., Carlsbad, CA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 481-489.

This paper presents the results of the Structural Demonstration of the AH-64 Attack Helicopter. The paper presents graphical data that shows the techniques used to attain the extreme points that define the flight envelope. The areas of the flight envelope that most challenge the various components of the helicopter are discussed. The methods used to assure flight safety during the program are also presented. Finally, the most highly loaded components are identified and the conditions and causes of the loads are presented. The Structural Demonstration was conducted successfully and all required maneuvers were performed without exceeding limit loads on any components. (Author)

A82-40552 # **Evaluation of an automatic subsystem parameter monitor.** R. V. Kurowsky and A. S. Santanelli (U.S. Army, Fort Monmouth, NJ). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 490-496.

It is pointed out that the workload of the pilot of an aircraft is not necessarily reduced by making available to the pilot a new type of avionics system architecture, if the pilot is still required to perform all the tasks he has traditionally performed. To achieve such a reduction in workload, the pilot should be used primarily as a decision maker with the ability to reprogram and command his machine in flight. The Electronic Master Monitor and Advisory Display System (EMMADS) is an information transfer system which will relieve the pilot of certain functions he has traditionally performed, such as monitoring aircraft subsystems. A description is presented of the test procedures which will be used to evaluate the operator/control/display interface of the EMMADS Advanced Development Model. G.R.

A82-40553 * # The prediction of helicopter rotor discrete frequency noise. F. Farassat (NASA, Langley Research Center, Hampton, VA) and G. P. Succi (Bolt Beranek and Newman, Inc., Cambridge, MA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 497-507. 23 refs.

An accurate prediction of the noise produced by helicopters requires a good understanding of the noise generating mechanisms involved. Such an understanding can lead to controlling the noise of existing helicopters by avoiding noisy regimes of flight or by redesigning the main and tail rotors. The present investigation is concerned with approaches which are suitable for the calculation of discrete frequency noise of helicopter rotors. The governing differential equation of acoustics used in a consideration of acoustic formulations is the Ffowcs Williams-Hawkings (FW-H) equation. Attention is given to a method reported by Farassat (1981), a method developed by Succi (1979), and a procedure discussed by Woan and Gregorek (1978). G.R.

A82-40554 # A semiempirical high-speed rotor noise prediction technique. K. R. Shenoy (Bell Helicopter Textron, Fort Worth, TX). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 508-516. 14 refs.

A semiempirical technique to predict high-speed noise of helicopter main rotors is discussed. This technique uses an existing data base, the properties of the equations governing the flow field, and empirical relationships to account for the changes in gross weight, blade chord and the blade rotational tip Mach number. The technique is verified through an application to full-scale flyover noise data and full-scale in-flight noise data. Hover test results for a model rotor are used to predict the noise levels for forward flight and are compared with wind tunnel test data. In addition, results of flow field investigations to study the effects of blade design parameters on high-speed noise and to extend the prediction technique are presented. These results are based on the flow field calculations made by using a three-dimensional, quasi-steady, full potential transonic analysis developed by NASA. (Author)

A82-40555 * # Dynamic surface measurements on a model helicopter rotor during blade slap at high angles of attack. J. E. Hubbard, Jr. and W. L. Harris (MIT, Cambridge, MA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 517-527. 16 refs. Research supported by the Massachusetts Institute of Technology; Grant No. NsG-1583.

The modern helicopter offers a unique operational capability to both the public and private sectors. However, the use of the helicopter may become severely limited due to the radiated noise generated by the rotor system. A description is presented of some of the experimental results obtained with a model helicopter rotor in an anechoic wind tunnel with regard to blade stall as a source mechanism of blade slap. Attention is given to dynamic rotor blade surface phenomena and the resulting far field impulsive noise from the model helicopter rotor at high angles of attack and low tip speed. The results of the investigation strongly implicates the boundary layer as playing an important role in blade slap due to blade/vortex interaction (BVI) in a highly loaded rotor. Intermittent stall cannot be ruled out as a possible source mechanism for blade slap. This implies that blade surface characteristics, airfoil shape and local Reynolds number may now be used as tools to reduce the resultant far-field sound pressure levels in helicopters. G.R.

A82-40556 # Helicopter model scale results of blade-vortex interaction impulsive noise as affected by blade planform. D. A. Conner and D. R. Hoad (U.S. Army, Structures Laboratory, Hampton, VA). In: American Helicopter Society, Annual Forum, 38th, Anaheim, CA, May 4-7, 1982, Proceedings. (A82-40505 20-01) Washington, DC, American Helicopter Society, 1982, p. 528-537. 21 refs.

An experimental investigation of the blade-vortex interaction impulsive noise characteristics of an advanced main rotor system for the UH-1 helicopter has been conducted. Models of both the advanced main rotor system and the standard UH-1 main rotor system were tested at one-quarter scale in the Langley 4- by 7-Meter (V/STOL) Tunnel using the General Rotor Model System (GRMS). Tests were conducted over a range of descent angles which bracketed the blade-vortex interaction phenomenon at a range of simulated flight speeds. The tunnel was operated in the open-throat configuration with acoustic treatment to improve the acoustic characteristics of the test chamber. The model data indicated that the advanced rotor system has increased the flight-scaled, LA noise produced by the UH-1 at all descent angles except where the blade-vortex interaction phenomenon was most intense for the standard UH-1 main rotor system. (Author)

A82-40561 # Research on the behavior of a turbojet engine during internal and external disturbances with respect to early recognition of damage (Untersuchungen über das Verhalten eines Turbostrahltriebwerks bei inneren und äusseren Störungen im Hinblick auf die Schadensfrüherkennung). H. Tönsköter. Aachen, Rheinisch-Westfälische Technische Hochschule, Fakultät für Maschinenwesen, Dr.-Ing. Dissertation, 1980. 215 p. 41 refs. In German.

The results of a theoretical and experimental study on the behavior of a single-wave turbojet engine during disturbances are presented. The simulated disturbances are categorized as either external or internal. The former influence flow relationships in the engine and vary their behavior, but entail no consequences for the engine parts. Damage and structural changes in the engine components are called internal disturbances. Experimentally obtained thermodynamic parameter changes are presented as volume divisions and average values. A program to calculate the stationary and dynamic operating behavior in turbojet engines is used to determine the extent to which the experimental results coincide with a one-dimensional computational procedure, and whether monitoring of operating behavior can be useful for early detection of damage. C.D.

A82-40562 # Research on an adaptive Kalman filter for solving the radar tracking problem (Untersuchung adaptiver Kalman-Filter zur Lösung des Radar-Zielverfolgungsproblems). W. Schumacher. Berlin, Technische Universität, Fachberich Verfahrenstechnik, Dr.-Ing. Dissertation, 1979. 128 p. 44 refs. In German. Research supported by the Deutsche Forschungsgemeinschaft.

The use of Kalman filters in automated air traffic control for failsafe measurement of local coordinates and speeds is discussed. Continuous and time-discrete models are constructed and an optimal filter is investigated. A sensitivity analysis is presented, followed by the design and simulation of an adaptive filter. Tracking at a one-level trajectory is discussed, and the design of an adaptive procedure is analyzed for different filter levels. C.D.

A82-40569 # Design and construction of a flexible autonomic electronic display device (Entwurf und Aufbau eines flexiblen autonomen elektronischen Anzeigegerätes). R. Frieling. Braunschweig, Technische Universität, Fakultät für Maschinenbau und Elektrotechnik, Dr.-Ing. Dissertation, 1980. 166 p. 40 refs. In German.

A compact, autonomic display device for presenting synthetic graphic images is needed for research work in the area of flight control. The device should also be suited for the presentation of dynamic processes. A device with the desired characteristics is currently not commercially available. The present investigation is concerned with the essential design criteria for the development and the construction of a display device which satisfies the considered requirements. The envisaged device consists of a microcomputer and an image element generator which contains digital differential analyzer (DDA) circuits. A detailed mathematical description of the generation of conic sections as image elements and the linear transformation of the elements provides the basis for universal employment possibilities of the device. The performance characteristics of the display device are illustrated with the aid of two examples, including an interpolation problem, and the display of data for flight control applications. G.R.

A82-40676 International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volumes 1 & 2. Edited by B. Laschka and R. Staufenbiel, New York, American Institute of Aeronautics and Astronautics, 1982. Vol. 1, 821 p.; vol. 2, 721 p. Members, $75.; nonmembers, $90. In English and French. (For individual items see A82-40677 to A82-41025)

Topics in aeronautical and aerodynamics research, development, implementation, and future directions are considered. The development and applications of Space Transportation Systems are described, and attention is also given to development programs for transport aircraft and military combat aircraft. Theoretical studies in flowfields, crew station design, and power plant materials and design are presented, along with investigations of aerodynamics, computational aerodynamics, control systems, and materials fatigue and tolerance. The uses of simulators for Orbiter pilot training, swept wings for efficient flight, and computer-controlled flight management systems are described, and examinations of vortex flows, structural dynamics, applications of composite structures, and canards are reported. M.S.K.

A82-40678 # Engineering aspects of international collaboration on Tornado. B. O. Heath (British Aerospace Public, Ltd., Co., Aircraft Group, Preston, Lancs., England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40676 20-01) New York, tex Sheet theory. Also shown are some interesting calculations for attached-flow and vortex-flow flap hinge moments that indicate flaps utilizing vortex flow may generate less hinge moment than attached flow flaps. Finally, trailing-edge flap effects on leading-edge flap thrust potential are investigated and theory-experiment comparisons made. (Author)

A82-41004 * # **Wind-tunnel investigation of vortex flaps on a highly swept interceptor configuration.** W. E. Schoonover, Jr. (NASA, Langley Research Center, Hampton, VA) and W. E. Ohlson (Boeing Military Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1276-1290. 15 refs.

A subsonic wind-tunnel investigation of the application of vortex flaps to a supersonic interceptor configuration is described. Experimental results are presented which indicate the aerodynamic effects of vortex-flap deflection, trailing-edge flap deflection, vortex flap chord and span, vertical stabilizers, and a highly cambered leading edge designed for attached flow. Data presented include longitudinal forces and moments, upper-surface pressure distributions, and oil- and smoke-flow visualization photographs. It is concluded that a full-span deployable vortex flap can provide a substantial performance improvement for this and other similar configurations. (Author)

A82-41005 # **Spanwise distribution of vortex drag and leading-edge suction in subsonic flow.** S. N. Wagner (München, Hochschule der Bundeswehr, Neubiberg, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1291-1301. 12 refs.

The spanwise distribution of the leading-edge suction force of wings with arbitrary planforms is calculated on the basis of a linear subsonic thin-wing theory and a study by Carlson and Mack (1980) on two-dimensional airfoil sections. The approach makes it possible to account for the effects of Mach number, Reynolds number, and wing parameters, including local thickness to chord ratio, location of the maximum wing section thickness, local leading-edge radius, and leading-edge sweep. Results obtained by the proposed method are found to be in good agreement with experimental data. V.L.

A82-41006 # **Fuselage effects in leading edge vortex flap aerodynamics.** J. F. Marchman, III and M. L. Hollins (Virginia Polytechnic Institute and State University, Blacksburg, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1302-1309. 8 refs.

Wind tunnel tests were conducted to determine the influence of a fuselage on the aerodynamic behavior of a 60 deg delta wing with leading edge vortex flaps. The results showed that at some combinations of angle of attack and yaw, the fuselage had a stabilizing effect on the leading edge vortices and that maximum lift is increased due to fuselage lift and added vortex stability. The fuselage did not affect the ability of vortex flaps to significantly increase the L/D of the wings. (Author)

A82-41007 # **New technology for the next generation of commercial transports - Real or imaginary.** I. S. Macdonald. In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1310-1320.

Economical, technical, financial, and legal implications associated with the needed replacement of technically and economically obsolete fleets of old commercial aircraft are examined. The discussion includes a brief review of the factors necessitating changes in aircraft fleets; a review of what aircraft and engine manufacturers have done to respond to the needs of the airlines to upgrade their fleets; new developments which will make it possible to increase the safety, efficiency, and profitability of commercial aircraft; and possible deterrents to the successful and useful implementation of new technology. V.L.

A82-41008 * # **An initial look at the supersonic aerodynamics of twin-fuselage aircraft concepts.** R. M. Wood, S. M. Dollyhigh, and D. S. Miller (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1320/a-1320/h. 15 refs.

Results of two studies into the supersonic aerodynamics of twin-fuselage aircraft configurations are summarized. In the first study, a set of experimental data was obtained on a simple rectangular-wing twin-fuselage wind-tunnel model; this data was then used to evaluate prediction methods, assess favorable interference effects, and identify any unexpected or unpredictable aerodynamic phenomena. Results are presented which show that significant reductions in wave drag are possible through optimum body positioning and that existing aerodynamic prediction methods are adequate for making preliminary aerodynamic estimates. Several configuration concepts were theoretically explored in the second study, and results are presented which indicate the sensitivity of the twin-fuselage concept to various methods of integrating the aircraft components. (Author)

A82-41009 # **Reduced nonlinear flight dynamic model of elastic structure aircraft.** J. Jankovic (Beograd, Univerzitet, Belgrade, Yugoslavia). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1321-1329. 11 refs.

A flight dynamics model defined by equations of motion for the case of an unconstrained deformable body subjected to aerodynamic forces, thrust load and aircraft weight is presented, with a deformable structure represented by the finite element method. A reducing method based on the small energy and large damping characteristics of very fast modes is introduced which involves the determination of the generalized coordinate nonlinear vector transformation which can turn the basic nonlinear model to a linear one. The method of decoupling linear systems to subsystems of slow and fast models makes it possible to extract fast structural modes and find a linear dependence between generalized, transformed coordinates. A criterion for neglecting these modes is also presented. It is, finally, necessary to find the nonlinear dependence between basic generalized coordinates which leads to the reduced nonlinear model of the system. O.C.

A82-41010 # **Determination of load spectra and their application for keeping the operational life proof of sporting airplanes.** H. J. Kossira (Braunschweig, Technische Universität, Brunswick, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1330-1338.

Modern load spectrum determination techniques are applied to glass fiber-reinforced plastic (GFRP) sailplanes, with attention to the estimation of aircraft structure service life. The use of such methods in the case of sailplanes is demanded by their combined gust and maneuver load environments. The preparation of data gathered during a limited time interval by means of computers, using Markov transition matrix storage and extrapolation to the total lifetime of the sailplanes, is demonstrated. O.C.

A82-41011 # **The role of the scale parameter in service load assessment and simulation.** J. Gedeon (Budapesti Muszaki Egyetem, Budapest, Hungary). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1339-1349. 23 refs.

The integral scale L, which is a universal parameter for stationary stochastic processes and complementary to the standard deviation, sigma, must be used in conjunction with sigma and one or two other parameters which are unique to the process being described in order to compose autocorrelation and power-spectral density functions. The conversion from measured to theoretical standard deviation and vice versa in the case of atmospheric turbulence measurement and evaluation, which is restricted to a finite frequency bandwidth, is feasible by means of the dimensionless parameter comprising L and the low frequency cutoff wavenumber. L may also be used for the direct calculation of time spectra from space spectra, and it facilitates the accurate treatment of stochastic transients. O.C.

A82-41013 # **Theoretical and experimental investigation of joint-structural damping interaction for airplane construction.** I. N. Krivosic (Beograd, Univerzitet, Belgrade, Yugoslavia). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1358-1367. 14 refs.

After considering previously published joint structural damping interaction studies and possible physical models for this phenomenon, experimental results for the case of typical aircraft structures are treated by employing the same geometrical model with different types of joints between the skin, stringers and transverse elements. Separate analyses are given for rivet, bolt and adhesive joints, and the corresponding mutual influence of the amplitude on structural damping is analyzed in light of the experimental results. O.C.

A82-41014 # **Optimizing aerospace structures for manufacturing cost.** B. R. Noton (Battelle Memorial Institute, Columbus, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings.

Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1358-1385.

The evolution of design/manufacturing interaction reveals the need for design methodologies to reduce aerospace systems cost. Cost-driver identification related to performance, design, materials, and manufacturing emphasizes the importance of the preliminary design phase. Data are required on designer-influenced cost elements, for example, with composites these are, hybrids, ply count, curing method, and quality requirements. A 'Manufacturing Cost/Design Guide' (MC/DG) for composite and metallic airframes, and also electronics, is discussed. Using examples of components and fuselage panels, the utilization of designer-oriented formats for relative and quantitative costs of manufacturing processes in trade-studies involving structural performance is shown. The MC/DC will also indicate potential cost savings of emerging technologies which accelerate technology transfer. (Author)

A82-41015 # **Composite structures repair.** H. Wicker (Grumman Aerospace Corp., Bethpage, NY). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1386-1392.

This paper concerns itself with the repair of composite materials on modern aircraft with particular emphasis on repair techniques and equipment for field use. The high strength to weight ratio of composites make them ideal to meet the demand for increasing the performance of military aircraft. However, with the increasing use of composite materials, a need has been created for unique repair methods. To meet the need to simultaneously apply pressure and a uniform temperature to the patch, a composite repair console and integral vacuum/-heater blanket was developed by Grumman. (Author)

A82-41016 # **Principles of achieving damage tolerance with flexible maintenance programs for new and aging aircraft.** J. Hall and U. G. Goranson (Boeing Commercial Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1393-1405.

Boeing has developed new technology and procedures for determining flexible structural maintenance programs that meet damage tolerance regulations. Rating systems, based on past maintenance, are used to develop inspection programs to ensure timely detection of structural damage from environmental deterioration (EDR), accident (ADR), or fatigue (DTR). The inspection program consists of two phases. Initially, the program is based on evaluations for detecting corrosion, stress corrosion, and accidental damage using the EDR and ADR systems. As the fleet matures, inspection tasks for detecting fatigue damage, based on the DTR evaluations are incorporated into the program. (Author)

A82-41018 # **Intake swirl - A major disturbance parameter in engine/intake compatibility.** F. Aulehla (Messerschmitt-Bölkow-Blohm GmbH, Munich, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1415-1424. 10 refs.

Based on theoretical considerations and primarily on experiment it is shown that all supersonic intakes of present combat aircraft produce essentially two types of swirl components of varying magnitude i.e. bulk and twin swirl. Depending on the sensitivity of the engine towards such disturbances serious engine/intake compatibility problems may arise, as for example engine surge and fan vibration. The remedial measures to overcome this problem are described and the solution of fenced intakes selected for Tornado is discussed. It is expected that this intake modification may also be of advantage for other high performance combat aircraft having similar intake configurations. Finally the relevance of dynamic total pressure distortion as prime compatibility parameter is questioned and a proposal for an improved intake disturbance simulation in engine bench tests is made. (Author)

A82-41019 # **An improved propulsion system simulation technique for scaled wind tunnel model testing of advanced fighters.** M. F. Eigenmann, P. A. Devereaux (McDonnell Aircraft Co., St. Louis, MO), and C. D. Wagenknecht (General Electric Co., Cincinnati, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1425-1436. 10 refs.

In the interest of accurately evaluating interactions between inlet and nozzle flowfields and between a propulsion system and aerodynamic surfaces, in advanced fighter aircraft having highly integrated and closely coupled propulsion systems, a supersonic propulsion simulator for wind tunnel models has been developed. A digital control console system was also developed in order to match model engine operational and control requirements that approximate those of a full scale engine. Attention is given to simulator engine components and wind tunnel model installation details, along with the efficient use of the simulator test technique in the various phases of a supersonic aircraft configuration's development program. The thrust/drag accounting system employing the simulator model for studies of basic aerodynamic performance and throttle-dependent effects is flowcharted, and the corrections necessary in each case are discussed. O.C.

A82-41020 # **Low-speed characteristics of a fighter-type configuration at high angles-of-attack and sideslip.** K. Huenecke (Vereinigte Flugtechnische Werke GmbH, Bremen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1437-1444.

Force measurements and flow observations were conducted on a fighter-type configuration as an aid to understanding the complex flow phenomena occuring at high angles-of-attack, with an; without sideslip. The configuration typically was provided with a cranked delta wing of aspect ratio 2.5; leading-edge sweep of 58 deg, wing-mounted vertical tails, and all-moving canard surfaces. The results indicate that certain configurational changes, such as vertical tailplane strakes, are sufficient to eliminate an otherwise unstable roll and yaw behavior occuring at around 22 deg angle-of-attack. (Author)

A82-41021 # **Wing design for supersonic cruise/transonic maneuver aircraft.** P. B. Gingrich and E. Bonner (Rockwell International Corp., El Segundo, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1445-1453. 9 refs.

An approach to multiple-design-point tactical aircraft wing development is discussed. Requirements for proposed tactical aircraft include both efficient supersonic cruise an; acceleration and enhanced transonic maneuvering performance. A computational approach was developed to address the conflicting requirements of these conditions. The approach consists of developing two point designs: a transonic maneuver configuration with weak shocks and nearly attached flow and an optimum supersonic cruise design. A compromise is then developed in an iterative cycle which seeks to approach the point design flow quality through the use of variable camber. Computational results for representative tactical aircraft are presented to illustrate the process. Test experience is discussed to indicate the performance achieved with compromise designs relative to point-design configurations. (Author)

A82-41022 # **Analysis of jet transport wings with deflected control surfaces by using a combination of 2- and 3-D methods.** N. J. Pfeiffer (Boeing Commercial Airplane Co., Seattle, WA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1454-1458. 6 refs.

A computational technique has been developed which analyses transport wings with deflected spoilers or ailerons. It uses 2-D separated flow analysis results in a 'strip theory' fashion to provide inputs for a 3-D lifting surface method. Wing body lift and pitching moments are quantitatively predicted and calculated spanloads qualitatively match experimental results. The method is accurate and economical enough to be useful in the basic design of control systems. (Author)

A82-41023 # **Optimization of canard configurations - An integrated approach and practical drag estimation method.** I. M. Kroo and T. McGeer (Stanford University, Stanford, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1459-1469. 16 refs.

A fundamental analysis of subsonic canard configurations illustrates some of the problems associated with such designs and difficulties encountered in their optimization. A general solution for minimum induced drag as a function of span ratio, vertical gap, and relative surface lifts is presented. Stability and trim requirements, together with the system geometry then determine the total induced drag and practical conclusions follow when structural weight and stalling speed constrains are added. Required chord and twist distributions are determined, illustrating the problems associated with multiple design points. Unlike conventional configurations, the canards' geometric variables associated with optimal solutions to each of the above problems vary widely, showing great sensitivity to constraints and off-design operation. (Author)

A82-41024 * # **Wind-tunnel investigation of a full-scale canard-configured general aviation aircraft.** L. P. Yip and P. F. Coy (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical

The causes and effects of distortion in aircraft scanner data are reviewed and an approach to reduce distortions by modelling the effect of aircraft motion on the scanner scene is discussed. With the advent of advanced satellite borne scanner systems, the geometric and radiometric correction of aircraft scanner data has become increasingly important. Corrections are needed to reliably simulate observations obtained by such systems for purposes of evaluation. It is found that if sufficient navigational information is available, aircraft scanner coordinates may be related very precisely to planimetric ground coordinates. However, the potential for a multivalue remapping transformation (i.e., scan lines crossing each other), adds an inherent uncertainty, to any radiometric resampling scheme, which is dependent on the precise geometry of the scan and ground pattern. E.A.K.

N82-28841# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio. Biodynamics and Bioengineering Div.

FIELD STUDIES OF THE AIR FORCE PROCEDURES (NOISECHECK) FOR MEASURING COMMUNITY NOISE EXPOSURE FROM AIRCRAFT OPERATIONS Final Report

R. A. Lee Mar. 1982 130 p
(AF Proj. 7231)
(AD-A113672; AFAMRL-TR-82-12) Avail: NTIS HC A07/MF A01 CSCL 20/1

This report describes the results of noise measurements at Laughlin AFB and Homestead AFB to field test the NOISECHECK equipment and procedures developed under contract by Bolt, Beranek and Newman, Inc. and Digital Acoustics Inc. NOISECHECK is the equipment and procedures used by the Air Force to spot check or validate the long term noise exposure predicted by NOISEMAP, the Air Force computer program for predicting community noise exposure from aircraft operations. The total noise exposure level at a specified location has an uncertainty associated with it whether the level is predicted or measured. The purpose of NOISECHECK is to determine the total noise exposure in terms of the Day-Night Level (DNL) metric for a specified ground location from direct measurements. NOISEMAP predicts DNL values for yearly-averaged 'busy days' aircraft operations. Therefore, the direct DNL measurements need to be normalized to this 'busy day' DNL. The NOISECHECK Procedures lead you through these normalizations in a straightforward step-by-step method. The results of the Laughlin and Homestead tests show that, with the proper data collection, the NOISECHECK procedures can validate the long-term noise exposure and explain any differences between the NOISEMAP predicted DNL values and the short term measurement DNL values. Author (GRA)

N82-28842# California Univ., Riverside. Statewide Air Pollution Research Center.

ATMOSPHERIC CHEMISTRY OF HYDROCARBON FUELS. VOLUME 2: OUTDOOR CHAMBER DATA TABULATIONS, PART 1 Final Report, Mar. 1980 - Sep. 1981

William P. L. Carter, Paul S. Ripley, Cecil G. Smith, and James N. Pitts, Jr. Tyndall AFB, Fla. AF Engineering and Services Center Nov. 1981 336 p 2 Vol.
(Contract F08635-80-C-0086; AF Proj. 1900)
(AD-A113665; AFESC/ESL-TR-81-53-V-2-P-1) Avail: NTIS HC A15/MF A01 CSCL 04/1

A total of 132 single- and multi-day outdoor environmental chamber experiments were conducted, involving nine different aviation and automotive fuels. These included the petroleum-derived JP-4 and JP-8 military aviation fuels, their shale-oil derived analogues, unleaded gasoline, diesel No. 2 fuel, and the experimental high energy cruise-missile fuels JP-10, RJ-4, and RJ-5. The program was conducted to assess the potential of these fuels to adversely affect air quality. Author

N82-28881*# Tennessee Univ. Space Inst., Tullahoma.

ANALYSIS OF VIBRATION INDUCED ERROR IN TURBULENCE VELOCITY MEASUREMENTS FROM AN AIRCRAFT WING TIP BOOM Final Report

Safwan H. Akkari and Walter Frost Washington NASA Jun. 1982 77 p refs
(Contract NAS8-34627)
(NASA-CR-3571; NAS 1.26:3571) Avail: NTIS HC A05/MF A01 CSCL 04B

The effect of rolling motion of a wing on the magnitude of error induced due to the wing vibration when measuring atmospheric turbulence with a wind probe mounted on the wing tip was investigated. The wing considered had characteristics similar to that of a B-57 Cambera aircraft, and Von Karman's cross spectrum function was used to estimate the cross-correlation of atmospheric turbulence. Although the error calculated was found to be less than that calculated when only elastic bendings and vertical motions of the wing are considered, it is still relatively large in the frequency's range close to the natural frequencies of the wing. Therefore, it is concluded that accelerometers mounted on the wing tip are needed to correct for this error, or the atmospheric velocity data must be appropriately filtered. Author

N82-29022*# Research Triangle Inst., Research Triangle Park, N. C. Systems and Measurements Div.

PROBLEMS RELATED TO THE INTEGRATION OF FAULT TOLERANT AIRCRAFT ELECTRONIC SYSTEMS

J. A. Bannister, V. Adlakha, K. Triyedi, and T. A. Alspaugh, Jr. Jun. 1982 167 p refs
(Contract NAS1-16489)
(NASA-CR-165926; NAS 1.26:165926; RTI/2094/02-02F) Avail: NTIS HC A08/MF A01 CSCL 09B

Problems related to the design of the hardware for an integrated aircraft electronic system are considered. Taxonomies of concurrent systems are reviewed and a new taxonomy is proposed. An informal methodology intended to identify feasible regions of the taxonomic design space is described. Specific tools are recommended for use in the methodology. Based on the methodology, a preliminary strawman integrated fault tolerant aircraft electronic system is proposed. Next, problems related to the programming and control of inegrated aircraft electronic systems are discussed. Issues of system resource management, including the scheduling and allocation of real time periodic tasks in a multiprocessor environment, are treated in detail. The role of software design in integrated fault tolerant aircraft electronic systems is discussed. Conclusions and recommendations for further work are included. M.G.

N82-29111*# Stanford Univ., Calif. Joint Inst. for Aeronautics and Acoustics.

THE EFFECT OF BARRIERS ON WAVE PROPAGATION PHENOMENA: WITH APPLICATION FOR AIRCRAFT NOISE SHIELDING

C. V. M. Mgana and I-Dee Chang May 1982 142 p refs
(Contract NCC2-76)
(NASA-CR-169128; NAS 1.26:169128) Avail: NTIS HC A07/MF A01 CSCL 20A

The frequency spectrum was divided into high and low frequency regimes and two separate methods were developed and applied to account for physical factors associated with flight conditions. For long wave propagation, the acoustic filed due to a point source near a solid obstacle was treated in terms of an inner region which where the fluid motion is essentially incompressible, and an outer region which is a linear acoustic field generated by hydrodynamic disturbances in the inner region. This method was applied to a case of a finite slotted plate modelled to represent a wing extended flap for both stationary and moving media. Ray acoustics, the Kirchhoff integral formulation, and the stationary phase approximation were combined to study short wave length propagation in many limiting cases as well as in the case of a semi-infinite plate in a uniform flow velocity with a point source above the plate and embedded in a different flow velocity to simulate an engine exhaust jet stream surrounding the source. A.R.K.

N82-29116# Technische Physische Dienst TNO-TH, Delft (Netherlands).

USE OF THE CAVITATION TUNNEL AT THE DUTCH NAVAL EXPERIMENT STATION (NSP), WAGENINGEN FOR THE DETERMINATION OF THE ACOUSTIC SOURCE STRENGTH OF PROPELLER CAVITATION [HET GEBRUIK VAN DE CAVITATIETUNNEL VAN HET NSP TE WAGENINGEN VOOR DE BEPALING VAN DE AKOESTISCHE BRONSTERKTE VAN SCHROEFCAVITATIE]

K. Verhulst 18 Aug. 1981 44 p refs In DUTCH
(Contract A72/KM/007)
(TPD-908-720; TDCK-75536) Avail: NTIS HC A03/MF A01

Experiments were performed, using a five blade model propeller, in order to investigate the possibilities of using the large NSP cavitation tunnel in the acoustical study of propeller cavitation. The influence of the hydrodynamic characteristics in the tunnel on the sound transmission to the tunnel wall was investigated. The transfer functions fluctuate strongly, even at a given water velocity or static pressure, probably due to acoustic damping in the tunnel circuit. For a turning propeller, the acoustic response of the tunnel wall due to propeller cavitation is very stable, since the degree of turbulence in the water, and thus the absorption, are very high. Author (ESA)

N82-29118# Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).

SOME COMMENTS ON THE PREDICTION OF FORWARD FLIGHT EFFECTS ON JET NOISE

Frank Obermeier Dec. 1981 37 p refs
(MPIS-20/1981; ISSN-0436-1199) Avail: NTIS HC A03/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 8.55

How aeroacoustic sound generation in turbulent jet flow is affected by a coflowing stream is considered. Experiment shows that simply allowing for Doppler effects, applied to the sound field of a static jet which is assumed to be known, does not yield convincing results. The effects of a coaxial stream on the aerodynamics of jet flow, i.e., the effects on its characteristic length and velocity, found experimentally, are critically reviewed through the literature. Results lead to a prediction scheme for in-flight effects on jet noise. A comparison of this method with test data exhibits good agreement. Author (ESA)

N82-29261# Federal Aviation Administration, Washington, D.C. Planning Analysis Div.

FAA AVIATION FORECASTS-FISCAL YEARS 1982-1993

Feb. 1982 72 p
(AD-A114696; FAA-APO-82-2) Avail: NTIS HC A04/MF A01 CSCL 01/2

This report contains the Fiscal Years 1982 to 1993 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with FAA control towers, air route traffic control centers, and flight service stations. Detailed forecasts were made for the four major users of the national aviation system: air carriers, air taxi/commuters, general aviation and the military. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, by the aviation industry and the general public. GRA

N82-29263# Aeronautical Research Inst. of Sweden, Stockholm. Aerodynamics Dept.

ON EMBEDDED FLOW CHARACTERISTICS OF SHARP EDGED RECTANGULAR WINGS

Erik S. Larson 21 Apr. 1982 19 p refs Backup Document for AIAA Synoptic scheduled for publication in the Journal of Aircraft, Feb. or Mar. 1983
(Log-C4712) Avail: NTIS HC A02/MF A01

The semiempirical, analytic expressions for steady, symmetric flow characteristics on thin rectangular wings at transonic speed are investigated. Semiempirical expressions representing aerodynamic characteristics of sharp edged rectangular wings are reported. The basic coefficients correlated very well with panel method results for Mach number of the free stream < or = 1, the intended domain of applicability. S.L.

N82-29267*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AERODYNAMICS OF AN AIRFOIL WITH A JET ISSUING FROM ITS SURFACE

D. A. Tavella and K. Karamcheti May 1982 93 p refs
(Contract NCC2-74)
(NASA-TM-84825; NAS 1.15:84825; SU-JIAA-TR-44) Avail: NTIS HC A05/MF A01 CSCL 01A

A simple, two dimensional, incompressible and inviscid model for the problem posed by a two dimensional wing with a jet issuing from its lower surface is considered and a parametric analysis is carried out to observe how the aerodynamic characteristics depend on the different parameters. The mathematical problem constitutes a boundary value problem where the position of part of the boundary is not known a priori. A nonlinear optimization approach was used to solve the problem, and the analysis reveals interesting characteristics that may help to better understand the physics involved in more complex situations in connection with high lift systems. Author

N82-29268*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AIRCRAFT GEOMETRY VERIFICATION WITH ENHANCED COMPUTER GENERATED DISPLAYS

J. V. Cozzolongo Jun. 1982 13 p refs
(NASA-TM-84254; NAS 1.15:84254) Avail: NTIS HC A02/MF A01 CSCL 01A

A method for visual verification of aerodynamic geometries using computer generated, color shaded images is described. The mathematical models representing aircraft geometries are created for use in theoretical aerodynamic analyses and in computer aided manufacturing. The aerodynamic shapes are defined using parametric bi-cubic splined patches. This mathematical representation is then used as input to an algorithm that generates a color shaded image of the geometry. A discussion of the techniques used in the mathematical representation of the geometry and in the rendering of the color shaded display is presented. The results include examples of color shaded displays, which are contrasted with wire frame type displays. The examples also show the use of mapped surface pressures in terms of color shaded images of V/STOL fighter/attack aircraft and advanced turboprop aircraft. Author

N82-29271*# Boeing Vertol Co., Philadelphia, Pa.

INVESTIGATION OF A ROTOR SYSTEM INCORPORATING A CONSTANT LIFT TIP Final Contractor Report

M. A. McVeigh, H. Rosenstein, K. Bartie, and F. J. McHugh Oct. 1981 326 p refs
(Contract NAS2-10769)
(NASA-CR-166261; NAS 1.26:166261) Avail: NTIS HC A15/MF A01 CSCL 01A

A wind tunnel test of a 16.8 ft. model of a rotor having passively controlled pivotable tips is described. Performance and vibratory hub load data are presented which compare the performance of the rotor with the tips free and fixed. A brief analysis of the experimental findings is included. S.L.

N82-29274# Federal Aviation Administration, Washington, D.C. Office of Aviation Medicine.

FLIGHT ATTENDANT INJURIES: 1971-1976

Donell W. Pollard, Earl D. Folk, and Richard F. Chandler Jan. 1982 60 p refs
(AD-A114909; FAA-AM-82-8) Avail: NTIS HC A04/MF A01 CSCL 01/2

Data from 206 reports of 377 flight attendant injuries occurring from 1971 through 1976 are summarized. These data were obtained from the Cabin Safety Data Bank of the Civil Aeromedical Institute, and are based on Federal Aviation Administration and National Transportation Safety Board accident/incident reports. Information relating to the severity and location of the injury is provided when available from original reports. Data relating to the flight condition and location in the aircraft where the injury occurred are provided. Summaries of each reported injury are included in the appendices. Author (GRA)

N82-29275# Federal Aviation Administration, Washington, D.C. Office of Aviation Medicine.

CRASHWORTHINESS STUDIES: CABIN, SEAT, RESTRAINT, AND INJURY FINDINGS IN SELECTED GENERAL AVIATION ACCIDENTS

William R. Kirkham, S. Marlene Wicks, and Donald Lee Lowrey Mar. 1982 24 p refs
(AD-A114878; FAA-AM-82-7) Avail: NTIS HC A02/MF A01 CSCL 01/2

This report reviews 47 survivable or partly survivable accidents investigated since 1973 by personnel from the Civil Aeromedical Institute. The accidents were reviewed for a number of features of crashworthiness and, in particular, for injuries to occupants in relation to the severity of the impact and the performance of cabin and restraint systems. Opinions were rendered by trained crash injury investigators as to the role or expected role in seats and upper torso restraints in adding to or lessening the injuries. The data support the general concepts that nonoccupiable portions of the aircraft receive greater physical damage than occupiable areas. The greatest damage to the occupiable area is to the forward portion of cockpit/cabin and the occupants have a greater chance of survival if the cockpit/cabin remains reasonably intact. Occupants seated forward in the cockpit/cabin receive greater injuries than those seated more rearward. Further, the findings suggest the seat placement or seat failure to one degree or another intensified injuries (as compared to more optimum crashworthy seats) to occupants in at least

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San Diego, CA, Aug. 9-11, 1982, Paper 82-1385. 17 p. 30 refs. Grant No. NAG1-134.

A semi-empirical method based on the suction analogy is developed to predict longitudinal aerodynamics and lateral-directional characteristics of slender wings at high angles of attack, including effects of vortex breakdown. The latter is based on a correlation parameter derived from the predicted leading-edge suction distribution in the attached flow. Empirical formulas, derived from a least-square analysis of data, for the vortex-breakdown angle of attack at the trailing edge, the progression rate of breakdown points and the vortex lift recovery factor in the breakdown region are given. Comparison of predicted results with data in longitudinal aerodynamics and lateral-directional characteristics for wings exhibiting strong vortex flow shows that the present method is reasonably accurate. Explanation for peculiar lateral-directional characteristics is given. (Author)

A82-39142 * # **Lateral aerodynamics of delta wings with leading edge separation.** J. Katz (Technion - Israel Institute of Technology, Haifa, Israel). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1386*. 12 p. 23 refs. Grant No. NAGW-00218.

An unsteady vortex lattice method is presented for the calculation of the aerodynamic forces acting on lifting surfaces undergoing complex three dimensional motion. For the present case the nonsymmetric motion of a slender delta wing was considered and the resulting lateral characteristics were calculated. The flow separation line was specified along the wing leading edge and the emanating vortex sheet shape and rollup was then calculated. Numerical results are presented for the combined high angle of attack and side slip condition and for the wing constant roll and coning motions. (Author)

A82-39143 # **Analytic extrapolation to full scale aircraft dynamics.** L. E. Ericsson and J. P. Reding (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1387*. 13 p. 57 refs.

It is pointed out that the extrapolation from subscale wind tunnel data to full scale flight becomes an especially serious problem at subsonic speeds when stall is involved and at high subsonic and transonic speeds where shock-boundary layer interaction can dominate the aerodynamics. In the case of dynamic testing, valid subscale simulation is often impossible. A description is presented of an approach which provides a solution to this preliminary design dilemma. The approach makes it possible to obtain a prediction of the full scale aircraft dynamics on the basis of an analytical extrapolation from subscale test data. The considered procedure establishes analytic relationships between dynamic and static aerodynamic characteristics induced by viscous flow effects. The veracity of the analytic method is proved by predicting dynamic test results using corresponding static test data at the same subscale flow conditions. Finally, the procedure provides the input necessary for extrapolation to full scale. G.R.

A82-39190 **Fixed pattern noise correction for staring arrays in guidance systems.** D. T. Whinray (British Aerospace Public, Ltd., Co., Dynamics Group, Hatfield, Herts., England). In: Advanced infrared detectors and systems; Proceedings of the Symposium, London, England, October 29, 30, 1981. (A82-39176 19-35) London, Institution of Electrical Engineers, 1981, p. 97-101.

Infrared guided missiles of the next generation are expected to show significant advances in performance over those in current service. These advances are partly related to an employment of focal plane arrays. A size advantage is gained by the removal of the traditional scanning mirror and drive systems. The introduction of an electronic scanned array provides speed and reliability advantages and also the potential of increased sensitivity. On the other hand, focal plane arrays do present their own set of problems in the areas of testing and operation. The present investigation is concerned with some of the aspects of testing and systems implementation of charge-coupled device (CCD) readout IR focal plane arrays which operate in the long wavelength atmospheric IR window. A description is presented of the principles of operation, and hardware techniques, which have been successfully used to achieve fixed pattern noise compensation at the high speeds necessary for focal plane arrays working in the long infrared waveband. G.R.

A82-39191 **Algorithm development for infra-red air-to-air guidance systems.** P. D. Allen and J. Northfield (British Aerospace Public, Ltd., Co., Dynamics Group, Hatfield, Herts., England). In: Advanced infrared detectors and systems; Proceedings of the Symposium, London, England, October 29, 30, 1981. (A82-39176 19-35) London, Institution of Electrical Engineers, 1981, p. 102-111.

General algorithms for the overall guidance of air-to-air infra-red missiles through the acquisition, tracking and terminal phases are described. Special attention is given to the vital area of initial target detection. Two 3 x 3 spatial operators are described and their response against naturally occurring cluttered sky images is reported. An assessment of the performance of each of these operators as discriminators of simulated targets against cluttered backgrounds has been made and is reported. The surprising result that point enhancement operators give impressive results even against large targets is discussed and qualified. (Author)

A82-39194 **Target tracking using area correlation.** R. M. B. Jackson (EMI Electronics, Ltd., Hayes, Middx., England). *(NATO, AGARD, Conference on Image and Sensor Data Processing for Target Acquisition and Recognition, Aalborg, Denmark, Sept. 8-12, 1980.)* In: Advanced infrared detectors and systems; Proceedings of the Symposium, London, England, October 29, 30, 1981. (A82-39176 19-35) London, Institution of Electrical Engineers, 1981, p. 124-130.

With the increasing use of electrooptical imagers in weapon systems for aircraft, there is a need to provide an automatic track of targets of interest to relieve the operation - who may be the pilot - of this task. A description is presented of a tracking system, based on the area correlator technique, which can provide a stable and accurate track of targets for use in airborne systems in conjunction with Forward Looking Infrared Radar (FLIR) or TV imagers. It is of small size and can be built into standard format packages for installation in military aircraft. The tracking system can handle targets with a wide range of characteristics, and it can adapt automatically to magnification and target aspect changes. G.R.

A82-39245 **The system of 'objective control' (Das System der 'Objektiven Kontrolle').** K.-D. Grätzsch (Interflug Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt*, vol. 18, no. 1, 1982, p. 1, 2. In German.

The concept of 'objective control' was originally developed as a control procedure in connection with the failure of components and systems of aviation equipment. However, it was soon recognized that this control method could also be employed for an evaluation of flight activities which is independent of subjective considerations. This advantage and the possibility to analyze flights, on a routine basis and in a manner which cannot be foreseen by the involved persons, has considerable educational significance. The system of 'objective control' in the case of a supervision of flight activities is based on the collection of information regarding the flight with the aid of onboard and ground-based equipment. This system makes it possible to initiate corrective action as soon as shortcomings with respect to the activities of the flying personnel are recognized. G.R.

A82-39246 **Rationalization of the maintenance process for helicopter Ka-26 (Rationalisierung des Instandhaltungsprozesses für Hubschrauber Ka-26).** K. Janeczek (Interflug Gesellschaft für Internationalen Flugverkehr mbH, Leipzig, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt*, vol. 18, no. 1, 1982, p. 3-7. In German.

Since 1970, the helicopter Ka-26 has been employed in the mountainous areas of the German Democratic Republic for agricultural applications. The maintenance program is a vital part of the utilization of the helicopter. The information obtained in connection with the use of the helicopter provided an indispensable basis for an efficient, cost-effective organization of the maintenance procedures. The enhancement of the efficiency of maintenance operations made it possible to increase the performance provided by the helicopter and to improve its reliability. Attention is given to the conventional maintenance system for helicopter Ka-26, the requirements for an optimization of maintenance procedures for the helicopter in agricultural applications, the development of an optimal maintenance system, and the introduction of suitable control procedures. G.R.

A82-39247 **Minimization of the total costs incurred in the employment of passenger jet aircraft (Minimierung der Gesamtkosten beim Einsatz von Strahlverkehrsflugzeugen).** J. Wilde (Interflug Gesellschaft für Internationalen Flugverkehr mbH, Leipzig, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt*, vol. 18, no. 1, 1982, p. 8-14. In German.

A description is presented of a procedure which makes it possible to minimize the total costs for the flight of a jet airliner. The procedure makes use of an optimization method which attempts to take into consideration all factors that affect the costs of a flight. The optimization problem is discussed, taking into account the various factors which affect fuel consumption and flight time, the determination of the Mach number which will provide a cost minimum, the consideration of meteorological factors and flight path characteristics, and the computation of fuel consumption. An investigation regarding the accuracy of the optimization calculation is also conducted. After the completion of a calculation including an optimization, it is possible to determine fuel consumption, flight times, and total costs for arbitrary Mach numbers by making use of the data stored in the computer as a result of the preceding calculation. Possible cost reductions for the operation of Interflug airliners are discussed, taking into account also the price for fuel at specific airports. G.R.

A82-39248 **Instrument landing systems /ILS/ at airports of the German Democratic Republic (Instrumentenlandesysteme /ILS/ auf DDR-Flughäfen).** W. Trempler (Interflug Gesellschaft für Internationalen Flugverkehr mbH, Leipzig, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt*, vol. 18, no. 1, 1982, p. 15-20. In German.

The introduction of a new generation of landing systems of the type ILS SP-70

(System Posadki-70), provided by the Soviet industry, began with the installation of the first system of the considered type at the airport Berlin-Schönefeld in 1978. Up to March 1981, three more ILS SP-70 were installed at airports of the German Democratic Republic. The utilization of the new SP-70 systems in Berlin and Leipzig has led to an improvement of aspects of flight safety for all arriving aircraft particularly under conditions of bad weather. The SP-70 is suited for automatic approaches according to the standards of the ICAO. Details concerning the ILS principles are discussed along with the characteristics of the ILS SP-70. The ILS SP-70 utilizes the most modern technology to satisfy Category III requirements. Attention is given to ground installations, functional descriptions of system components, and antenna diagrams. G.R.

A82-39263 † **The effect of hybrid composite materials on the dynamic characteristics of helicopter rotor blades (Vliianie gibridnykh kompozitnykh materialov na dinamicheskie kharakteristiki lopastei vertoletov).** E. G. Pak, V. N. Stekol'nikov, Iu. P. Ganiushkin, R. V. Ivannikova, and V. N. Kestel'man. *Mekhanika Kompozitnykh Materialov*, May-June 1982, p. 475-479. 7 refs. In Russian.

It is shown that changes in the relationship between the rigidity and mass characteristics of helicopter rotor blades can be effected by varying the modulus of elasticity of the structural material of the spar. Hybrid composite materials make it possible to achieve this by combining in one matrix several reinforcing fillers with different physical and mechanical properties. The optimal combination is that of glass and carbon fibers. The carbon-and-glass-reinforced plastic makes it possible to increase the rigidity of the spar without changing the mass characteristics as well as to increase the fatigue strength. B.J.

A82-39275 **Application of an optical data link in the airborne scanning system.** M. J. Green (Wisconsin, University, Madison, WI). *Review of Scientific Instruments*, vol. 53, Aug. 1982, p. 1278-1280.

A scanning thermal IR radiometer has been used in the acquisition and digital processing of thermal imagery. In connection with plans for a study of oceanic thermal fronts, attention has been given to the possibility to employ the scanner in a system for mapping sea surface temperature which could be used with the Navy P-3 patrol aircraft. The main obstacle to such an employment is that, since the aircraft are to be used on an 'aircraft-of-opportunity' basis, no modifications to the aircraft would be permitted. The scanner is comprised of two principal subsystems, including the scanner head itself and a power supply/signal conditioning chassis. These two units are normally connected by a 39-conductor cable. As the requirements regarding the Navy application do not permit an employment of the normal connection, an optical data link has been fabricated which can replace the hard-wired connections between scanner head and power supply. G.R.

A82-39279 † **Primary-data devices (Pribory pervichnoi informatsii).** V. A. Bodner. Moscow, Izdatel'stvo Mashinostroenie, 1981. 344 p. 29 refs. In Russian.

The work examines the theoretical principles, design, and analysis of primary-data devices, i.e., sensors that are used to acquire information necessary for the control and monitoring of flight vehicles. Particular consideration is given to advanced measurement techniques (pulse-time and frequency output devices, correlation devices, etc.), the computer-aided design of the devices with allowance for complex optimization, the use of microprocessors, and automatic error compensation. Attention is given to sensors for measuring pressure, temperature, fuel consumption, flight speed and altitude, and acceleration. B.J.

A82-39295 † **The operation of aircraft and helicopters in difficult meteorological and environmental conditions (Ekspluatatsiia samoletov i vertoletov v uslozhnennykh prirodnykh usloviiakh).** A. M. Volodko. Moscow, Izdatel'stvo Transport, 1981. 158 p. 48 refs. In Russian.

The effects of such adverse phenomena as turbulence, ice formation and hail, wind shear, and lightning on the operation of aircraft are considered. Attention is also given to the effects of high and low air temperatures, dust in the air, and air moisture. Biological damage (from microorganisms, insects, and birds) is also considered along with conditions of helicopter flight in mountain areas and clouds. B.J.

A82-39321 **Flight management computers (Calculateurs de gestion du vol).** J. Grossin (Société Nationale Industrielle Aérospatiale, Toulouse, France). *L'Onde Electrique*, vol. 62, June-July 1982, p. 59-66. 11 refs. In French.

Flight management computers (FMC) and their role in reducing fuel consumption in commercial aircraft are examined. Research to offset rising fuel costs is concentrating on improving engine efficiency and the aerodynamic performance of the aircraft, and in flight control computers which automate control of flight and systems to the most efficient levels. Implementation of FMC with the Airbus is described, including the retrofit to provide accurate navigation and economical ascent and descent. Flight time at low speed and altitudes is minimized, and systems surveillance and fuel flow are automated. Block diagrams are presented of the systems interconnections with the FMC and the control strategy. Flight plans fed into the FMC yield an optimized flight strategy based on a plan involving lowest cost. The flight is categorized into ascent, cruise, and descent phases. Constraints which can alter the plan consist of changes in altitude to maintain proper cruise speed, the tempo of the flight in reaching fixed ground reference points, and operational limits of the aircraft. M.S.K.

A82-39322 **Electronic stabilization of an aircraft (Stabilisation d'un avion par l'électronique).** A. Chadeau (Ministère de la Défense, Service Technique des Télécommunications et des Equipements Aéronautiques, Paris, France). *L'Onde Electrique*, vol. 62, June-July 1982, p. 67-71. In French.

The applications of electronic flight control systems (EFC) to the amelioration of engine troubles and to automatic pilot systems are reviewed. Nominal instabilities are automatically corrected in-flight through commands implemented by electrohydraulic servocontrols responding to preset tolerances for the flight envelope parameters, including airspeed, altitude, pitch, route, and landing functions. EFC systems permit the use of aircraft configurations which experience instabilities which could not be handled by a human pilot, but can be electronically altered so that control of the aircraft appears similar to simple mechanical linkage. Digitized control of a modern aircraft is noted to require over 400,000 operations/sec, with control decisions being weighted toward safety through calculations of the probability of occurrence of destabilizing events and an assessment of the total effect a command decision will have on the aircraft. It is concluded that progress toward introducing new control stragegies is slow, in order to maintain the accuracy and operability of preexisting systems. M.S.K.

A82-39323 **Air-air collision avoidance systems (Systèmes d'anticollision air-air).** A. Michel (Direction Générale de l'Aviation Civile, Service Technique de la Navigation Aérienne, Paris, France). *L'Onde Electrique*, vol. 62, June-July 1982, p. 72-82. 10 refs. In French.

Methods of improving air-to-air collision avoidance through ground based actions are asserted to reside in flow control, by restricting the number of flights to levels which can be handled by available controller personnel aided by computers and radar. An on-board collision avoidance system is offered as a means to ameliorate the workload on the ground. The systems tested thus far have operated between 1520-1620 MHz and work multilaterally, obtaining identification of nearby aircraft, their relative distance, altitudes, and characterizing their approach paths. Attention is given to various systems developed as prototypes for operational systems, noting that the FAA is requiring that any system used be compatible with ATC. Characteristics of the Discrete Address Beacon System introduced in 1980 are presented, including methods for the suppression of erroneous data. Problems in perfecting the control logic for the detection systems are discussed. M.S.K.

A82-39358 # **The unsteady motion of a wing traveling at subsonic speed above a plane (Neustanovivsheesia dvizhenie kryla s dozvukovoi skorost'iu nad ploskost'iu).** E. A. Krasil'shchikova. *Revue Roumaine de Mathématiques Pures et Appliquées*, vol. 27, no. 3, 1982, p. 363-370. In Russian.

An analysis is presented of the plane-parallel flow of a compressible fluid excited by a thin wing moving at subsonic speed above a plane, the motion of the wing taken to begin from a state of rest. The aerodynamic problem is viewed as a combination of boundary value problems with a moving boundary for the two-dimensional wave equation. Each of these problems is solved by the method of integral equations in characteristic coordinates. The velocity potential is represented in recursive formulas, which make it possible to analyze the interaction of the wing and plane for arbitrary moments of time. B.J.

A82-39359 # **The rectangular wing with semiinfinite span in nonlinear theory (Der rechteckige flugel halbunendlicher spannweite in der nichtlinearen theorie).** S. Turbatu (Bucuresti, Universitatea, Bucharest, Rumania). *Revue Roumaine de Mathématiques Pures et Appliquées*, vol. 27, no. 3, 1982, p. 419-422. 10 refs. In German.

In an investigation of unsteady flow, use is made of an approach considered by Teipel (1964), Hosokawa (1964), and Ruo (1974). It is assumed that unsteady effects are superimposed on steady flow, taking into account a consideration of these effects in the first order. The concepts employed in connection with the solution of the nonlinear differential equation are similar to those used by Oswatitsch and Keune (1955) for the steady flowfield. A boundary-value problem in two parts regarding the potential of a rectangular wing with semiinfinite span in a state of harmonic oscillations is also solved, taking into consideration the case of unsteady transonic flow in a nonlinearized treatment. G.R.

A82-39374 **Optimal control application in supersonic aircraft performance.** C.-F. Lin (Michigan, University, Ann Arbor, MI). *IEE Proceedings, Part D - Control Theory and Applications*, vol. 129, pt. D, no. 4, July 1982, p. 113-117.

In the present investigation, the aerodynamic and engine characteristics of a typical lightweight high thrust/weight ratio fighter are modelled as continuous functions of a state variable, the Mach number. This approach provides the possibility for a smooth application of optimal control theory. By introducing a set of dimensionless variables, general results are obtained for an entire class of vehicles with similar physical characteristics. Numerical solutions are presented

American Institute of Aeronautics and Astronautics, 1982, p. 8-22. 11 refs.

Design features, engineering goals, and the performance envelope of the Tornado combat aircraft are described. The fighter was developed to perform air-to-ground, interdictor/strike, naval strike, reconnaissance, air superiority, interception, and training missions. The distribution of responsibilities and management authority among the organizations of the three nations which participated in the development program are outlined, along with decisions in the evolution of the design. A new engine was developed as a cost-saving measure, and the aircraft was built to ensure that no single failure would endanger flightworthiness. Easy access was also added to the Tornado systems in order to hold down repair time and costs. M.S.K.

A82-40879 # Advanced aerodynamic design for future combat aircraft. B. R. A. Burns (British Aerospace Public, Ltd., Co., Preston, Lancs., England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 23-33.

Progress in aerodynamic design features to enhance the effectiveness and performance of combat aircraft are reviewed. Higher turning performance at subsonic and transonic speeds has been achieved through improvements in the lift/drag ratio by providing for attached flow on the upper part of the wings. The effects of wing root leading edge strakes and aeroelastic tailoring on flight performance are discussed, and methods of augmenting the turning performance by adding wing interference to the jet exhaust are considered. Pilot workload has been lowered by active flight controls, which allow full exploitation of modern aircraft flight and maneuvering envelopes, while gust alleviation has ensured stable flight during high speed, low altitude flight. Intake duct geometry has been configured to permit operation at high angles of attack and in sideslip, while an underfuselage carriage scheme has been developed which greatly reduces interference drag compared with conventional underwing carriage. M.S.K.

A82-40880 # Some aerodynamic/flightmechanic aspects for the design of future combat aircraft. P. Mangold (Dornier GmbH, Friedrichshafen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 34-43. 6 refs.

At an early project state of a future combat aircraft, designed with negative static stability, it is necessary to go through an optimization process in order to minimize the complexity and cost for the control system by avoiding undesirable aerodynamic characteristics. A careful refinement of certain parts of the configuration gives the chance to stay within the limits and to meet the criteria and goals for the desired longitudinal and lateral basic behavior. General trends, evaluated from many wind tunnel tests, are presented which show the influence of changing LEX size, shape of fuselage nose, slats, vertical tails etc. Concerning maximum attainable negative static margin one limit is set by the time to double amplitude after a gust disturbance. Looking at some typical existing and projected combat aircraft the paper discusses the fact and the consequences that the same Time To Double leads to different (attainable) static margins. (Author)

A82-40881 # Gust load alleviation on Airbus A 300. O. Sensburg, J. Becker, H. Lusebrink, and F. Weiss (Messerschmitt-Bölkow-Blohm GmbH, Munich and Hamburg, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 44-58. 15 refs.

An active gust load alleviation system for an Airbus A 300 with a 10% wing span increase is described, along with passive maneuver load alleviation. The introduction of active control systems is intended to minimize the incremental structural dynamic loads caused by span expansion or increased wing loading, especially due to gusts. The gust magnitude is assayed by a vane or differential pressure sensor in the front fuselage, weighted with a time delay for the vane to wing transit. Actuator transfer functions are introduced into the existing active flight controls to compensate fo; unsteady aerodynamic effects. A block diagram of the closed loop gust alleviation system is provided, along with linearized equations of motion of elastic aircraft with closed or open loop systems. Finally, further studies are indicated in unsteady effects in order to implement passive maneuver load alleviation. M.S.K.

A82-40882 # Calculations of transonic steady state aeroelastic effects for a canard airplane. N. Agrell and S. G. Hedman (Flygtekniska Forsoksanstalten, Bromma, Sweden). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 59-66. 5 refs. Forsvaret Materielverk *Contracts No. AU-1540;* No. AU-1691.

A transonic small perturbation potential method for calculation of the aeroelastic effects on aircraft with a canard is presented, and comparisons are made with results of earlier calculations. The equation for the disturbance potential is defined and the velocity potential is transformed into a finite difference form. Boundary conditions are formulated for subsonic and supersonic regimes and methods of treating steady state aeroelastic effects are discussed. A numerical mesh is devised using the SAAB 37 Viggen as an example and solution procedures at sub- and supersonic speeds are presented, covering the speed range of Mach 0.9-1.1. Aeroelastic deformation is calculated by balancing aerodynamic loads against interior forces. M.S.K.

A82-40883 # Computer-aided derivation of equations of motion for rotary-wing aeroelastic problems. F. Kiessling (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Aeroelastik, Göttingen, West Germany). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 67-77. 13 refs.

A general computer-algebra system has been applied to derive literal equations of motion for the aeroelastic behavior of rotary-wings. Inertia, elastic, structural damping, aerodynamic, and gravitational contributions are considered. Modal degrees of freedom are provided to represent elastic rotor blades. The program input comprises mainly a kinematic description of the system. A weighting scheme is used to obtain the most important terms in a consistent manner. Multiblade coordinate transformation is applied to reduce or to eliminate periodic coefficients. As output, matrices are written in FORTRAN code, which reflect the mathematical model and can be used for further numerical calculations. As an example, the suggested procedure is applied to a model of a two-bladed wind turbine mounted on an elastic tower. (Author)

A82-40884 # HAJIF-II - A program system for the dynamic analysis of aeronautical structures. G.-G. Liu and J.-J. Li (Chinese Aeronautical Establishment, Beijing, People's Republic of China). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 78-82. 17 refs.

HAJIF-II is a program system developed for the calculation of modal parameters of aircraft structures as well as flutter and gust response analyses with active control systems taken into consideration. Ninety-nine substructures, each with 7000 degrees of freedom, can be used in the calculation of modal parameters and 50 modes for the flutter and gust response analyses. Some new techniques, such as a revised hypermatrix technique, an improved algorithm of simultaneous iteration, and new methods of modal synthesis etc., were developed to improve the efficiency of the system. Typical aircraft structures were analyzed and good results were obtained. (Author)

A82-40886 # A practical approach to the incorporation of technical advances in avionics. J. D. Bannister and D. Roughton (British Aerospace Public, Ltd., Co., Aircraft Group, Brough, North Humberside, England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 97-107.

Features of a program to design, develop, and construct an avionic system demonstrator rig for the next generation of tactical combat aircraft while taking advantage of advances in VLSI hardware are described. The VLSI-based architecture permits shared communication and displays, in addition to sensor-dedicated microprocessors. Military standard data busses can currently handle up to 31 subsystems through a common transmission line, and further determinations are needed to identify the effects of common mode failures, limitations on the amount of traffic on a bus, the effects of transmission delays, and particular links which cannot be routed through a data bus. Details of the functional aspects of pilot, system control, mission, navaids, and aircraft groups to define problem areas, goals, and method to allow an acceptable transition to VLSI-based avionics are discussed. M.S.K.

A82-40887 # Applying advanced technology to flight station design. W. R. Paden, Jr. and G. A. Sexton (Lockheed-Georgia Co., Marietta, GA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 108-117.

Efforts by Lockheed to develop a flight simulation research facility are described, including the construction of a functional pilot's desk flight station, aircraft systems, and controls expected to be in use in the 1990s. Simulators are being constructed to accommodate high resolution CRT color graphics, flat panel displays, touch panel controls, voice command and response systems, head-up displays, and electronic flight and thrust controllers. Stages in the realization process are outlined, noting current status in the design and fabrication of the simulator hardware and software. Systems under study are an appropriate color format, display formats, and advisory, caution, and warning system and cockpit display of traffic information format. Further research on the effects of introduction of the new equipment on pilot performance and on air traffic control are indicated. M.S.K.

A82-40888 # **The evolution of display formats for advanced fighters using multimode color CRT displays.** N. M. Lefritz, J. H. Tuttle, Jr. (Rockwell International Corp., El Segundo, CA), and M. J. Forte (Bendix Corp., Teterboro, NJ). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 118-131. Research supported by the Rockwell Independent Research and Development Fund.

Efforts to combine electromechanical indicators, instruments, and displays onto multimode, time-shared CRT displays (MMD) in advanced cockpit configurations for military aircraft are described. A cockpit configuration is presented in which the stick controller is situated to the right of the pilot, while the center console contains three MMDs. Color formatting was guided by goals to minimize electromechanical displays, provide the pilot with information relevant solely to a given mode of operation, have all data available at the pilot's option, use color and formats already implemented by the military, replace symbolic information with pictorial information, and employ the CRT for checklists. Procedures for completing an electronic preflight checklist are detailed, in addition to take-off, climb to cruise, emergency conditions, and landing sequences. M.S.K.

A82-40889 # **Application of advanced exhaust nozzles for tactical aircraft.** D. L. Bowers and J. A. Laughrey (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 132-141. 39 refs.

Advanced exhaust nozzles play an important role in the system design for advanced tactical aircraft and offer attractive design options which contribute to total aircraft performance. These exhaust nozzles can improve aircraft cruise performance if integrated carefully. Thrust vectoring attainable with these exhaust nozzles adds significantly to aircraft maneuver performance. STOL performance is obtained by thrust reversing or a combination of thrust reversing and thrust vectoring. The significant aircraft performance improvements which lie in advanced exhaust nozzle technology will be determined by past, ongoing and future programs investigating the best application of advanced exhaust nozzles for tactical aircraft. (Author)

A82-40890 # **Optimized 10 ton class commercial aircraft engine.** R. Laurens (SNECMA, Moissy-Cramayel, Seine-et-Marne, France). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 142-145.

The development program goals and methods for the CFM56 series engines for powering aircraft of 110 to 200 passengers into the 1990s are reviewed. The CFM56, in the 20,000 lb class, began with the F101 core. Derivatives of the engine are currently used in the DC8-60, the KC-135 tanker, and the 737. Compression ratios have been raised from 25-30:1 to 35-40:1, and the core features a low clearance compressor with rotor temperature control, variable stators on the first four stages, a high speed HP turbine, active clearance cooling in the turbine, and close turning clearances. High energy X rays are being employed to improve the clearances and survey the temperature map and cooling system. A commonality of 60% has been maintained between generations of the engine. M.S.K.

A82-40891 # **Recent advances in the performance of high bypass ratio fans.** D. J. Nicholas and C. Freeman (Rolls-Royce, Ltd., Derby, England). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 146-158. 7 refs. Research supported by the Ministry of Defence (Procurement Executive).

Theoretical and experimental techniques employed to improve the efficiency of the high tip speed fan jet engine are reviewed. Design features of high bypass ratio fans, including arrangement of the fan diffusion factors induced by the placement of the outlet guide vanes and the splitter are discussed. Overall design parameters of the RB211-22 fan are described, including factors influencing the spanwise work distribution, the outlet guide configuration, and techniques for characterizing the airflow. It was found that an optimum tip speed existed for each level of design pressure ratio. Performance tests on scale model rigs to determine the spanwise distribution, the blade element performance, and airfoil losses, were compared with actual engine operation. It is noted that laser holography, anemometry, and two- and three-dimensional numerical models were employed to identify and define the flow in test rig conditions. M.S.K.

A82-40892 # **Axisymmetric approach and landing thrust reverser impacts on usage and LCC.** J. P. Blackman, P. B. Stumbo (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, OH), and M. F. Eigenmann (McDonnell Aircraft Co., St. Louis, MO). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 159-167. 7 refs.

The effects on the performance of the F15-C and advanced fighters by the installation of three different types of approach and landing thrust reversers (ALTR) are reported, including projected impacts on thy life cycle costs (LCC). The aircraft were tested in mission configurations comprising a 350 nm subsonic cruise and 200 nm supersonic dash at high altitude, along with appropriate defensive maneuvers. The ALTR concepts examined included a rotating vane upstream of the nozzle throat, a translating shroud ALTR downstream of the throat, and a three-door ALTR downstream of the nozzle throat of the advanced air-to-surface vehicle. Effects were evaluated in terms of the resultant engine hot time, and cycles of use of the ALTRs in a variety of mission modes. The F15-C LCC was estimated to cost 3.8% more using the ALTR, while advanced vehicle LCCs increased 2.4-3.8%, with smallest increases occurring with downstream ALTR placement. M.S.K.

A82-40893 * # **Observations and implications of natural laminar flow on practical airplane surfaces.** B. J. Holmes (NASA, Langley Research Center, Hampton, VA) and C. J. Obara (Kentron Technical Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 168-181. 46 refs.

The results of natural laminar flow (NLF) experiments conducted by NASA to determine if modern aircraft structures can benefit from NLF as do sailplanes are presented. Seven aircraft, ranging from a Cessna 210 to a Learjet 28/29, with relatively stiff skins were flown in production configurations with no modifications. Measurements were made of the boundary-layer laminar to turbulent transition locations on various aerodynamic surfaces, the effect of a total loss of laminar flow, the effect of the propeller slipstream on the wing boundary-layer transition and the boundary-layer profiles, the wing section profile drag, the effect of flight through clouds, and insect debris contamination effects. Favorable pressure gradients for NLF were concluded to be feasible up to a transition Reynolds number of 11 million. Laminar flows were observed in propeller slipstreams, and insects were found to cause transition 1/4 of the time. M.S.K.

A82-40894 # **Aerodynamic development of laminar flow control on swept wings using distributed suction through porous surfaces.** J. A. Thelander, J. B. Allen, and H. R. Weige (Douglas Aircraft Co., Long Beach, CA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 182-189. 8 refs.

Development of a laminar flow control system utilizing distributed suction through porous strips is reviewed. Recent improvements in electron beam perforation technology have greatly enhanced the potential for practical LFC application. The design of airfoil shapes compatible with LFC on swept wings is outlined. Boundary layer stability analysis results and determination of suction distributions are reviewed. Considerations for an operational system for protection from ice and insect contamination are noted. Results of a swept wing model test and plans for a LFC leading edge glove flight test program are reviewed. (Author)

A82-40895 # **External aerodynamic design for a laminar flow control glove on a Lockheed JetStar wing.** J. A. Bennett and L. B. Brandt (Lockheed-Georgia Co., Marietta, GA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 190-202. 34 refs.

A recent study contract for a subsonic laminar flow control (LFC) transport with a supercritical wing and recent Lockheed research are discussed as background information leading to the design of a JetStar part-span LFC glove to be flight-tested. The special design requirements needed to develop the glove and some of the problems encountered during the process are presented. The following topics are discussed: a method of simulating the interference effects of the body/pylons/nacelles on wing pressures when using an isolated-wing code, wind-tunnel testing of a JetStar model with a wing glove and correlation with theoretical glove pressures, and suction requirements for maintaining a laminar boundary layer. (Author)

A82-40896 * # **NASA research on viscous drag reduction.** R. H. Petersen and D. V. Maddalon (NASA, Langley Research Center, Hampton, VA). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 1. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 203-213. 42 refs.

Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 22 (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1470-1488. 11 refs.

As part of a broad research program to provide a data base on advanced airplane configurations, a wind-tunnel investigation was conducted in the Langley 30-by 60-Foot Wind Tunnel to determine the aerodynamic cha5 axeristics of an advanced canard-configured general aviation airplane. The investigation included measurements of forces and moments of the complete configuratio , isolated canard loads, and pressure distributions on the wing, winglet, and canard. Flow visualization was obtained by using surface tufts to determine regions of flow separation and by using a chemical sublimation technique to determine boundary-layer transition locations. Additionally, other tests were conducted to determine simulated rain effects on boundary layer transition. Investigation of configuration effects included variations of canard locations, canard airfoil sec on, winglet size, and use of a leading-edge droop on the out-board section of the wing. (Author)

A82-41025 # Wind tunnel measurements of longitudinal stability and control characteristics of primary and secondary wing configurations. H. L. Chevalier (Texas A & M University, College Station, TX). In: International Council of the Aeronautical Sciences, Congress, 13th and AIAA Aircraft Systems and Technology Conference, Seattle, WA, August 22-27, 1982, Proceedings. Volume 2. (A82-40876 20-01) New York, American Institute of Aeronautics and Astronautics, 1982, p. 1489-1494.

Low speed wind tunnel measurements of the variations in pitching moment coefficient with angle of attack are described for primary and secondary wing configurations, wing-canard combinations. Experimental results are shown for various vertical and horizontal distances between the surfaces, canard incidence angles and canard flap angles. These experimental results show that the stability is nonlinear with both angle of attack and incidence angle and as a consequence the pitching moment coefficient at zero lift is an important parameter affecting the stability at trim conditions. At high angles of attack, above canard stall, the change in pitching moment coefficients with canard incidence angle and flap angle is reduced and for some configurations the change is reversed. Results also show that wind tunnel tests, at the appropriate Reynolds Number, are needed to determine longitudinal stability and control characteristics of wing-canard combinations. (Author)

A82-41055 Monopole antenna patterns on finite size composite ground planes. C. A. Balanis (West Virginia University, Morgantown, WV) and D. DeCarlo (Naval Air Systems Command, Naval Air Test Center, Patuxent River, MD). *IEEE Transactions on Antennas and Propagation*, vol. AP-30, July 1982, p. 764-768. 9 refs.

The geometrical theory of diffraction methods is used to develop models and to predict the patterns of communications, navigation, and identification (CNI) blade antennas mounted on finite size composite ground planes. The computed patterns are found to agree extremely well with measurements. It is shown, both analytically and experimentally, that very minor differences between patterns of antennas mounted on perfectly conducting and composite ground planes appear for conductivities equal to 10,000 s/m. The anisotropy effect of the composite material on the antenna patterns is thought to be undetectable, at least within the system measuring accuracy. Therefore, perfectly conducting models can be used to analytically investigate the electromagnetic scattering properties of composite materials with conductivities equal to or greater than 10,000 s/m. C.R.

A82-41075 Heat release rate calorimetry of engineering plastics. A. L. Bridgman and G. L. Nelson (General Electric Co., Pittsfield, MA). *Journal of Fire and Flammability*, vol. 13, Apr. 1982, p. 114-134. 27 refs.

The Ohio State University Heat Release Rate Calorimeter (OSUHRRC) is examined as a means of defining the fire characteristics of engineering plastics under closely controlled and defined conditions of exposure to incident thermal radiation. The principles and operation of the OSUHRRC are described, and examples of tests are presented utilizing engineering thermographics. A typical test is described in detail, and the factors affecting the results, including reproducibility, external heat flux, and sample thickness, are examined. The improvement in fire retardancy resulting from the incorporation of flame retardants into test specimens is documented for polycarbonates. Comparisons of the results with large-scale foam box tests show the same relative rankings with respect to both temperature and smoke performance. C.D.

A82-41114 # Design of a longitudinal ride-control system by Zakian's method of inequalities. T. R. Crossley (Salford; University, Salford, England) and A. M. Dahshan (Military Technical College, Cairo, Egypt). *Journal of Aircraft*, vol. 19, Sept. 1982, p. 730-736. 36 refs.

In this paper, Zakian's method of inequalities is applied to the design of a ride-control system for a STOL aircraft. The purpose of the controller is to reduce the normal acceleration experienced by both passengers and crew. The method is based on the synthesis of a controller such that a set of performance specifications and constraints is satisfied. Controllers are designed on the basis of the characteristics of both the closed-loop step response and the closed-loop error response. It is shown that the design of a single-input, single-output controller by the method of inequalities is straightforward, and can be achieved by using a sequence of formulations until the designer is satisfied that no further improvement is necessary. (Author)

A82-41115 # Fatigue behavior of weldbonded joints. G. V. Scarich and G. R. Chanani (Northrop Corp., Aircraft Div., Hawthorne, CA). *Journal of Aircraft*, vol. 19, Sept. 1982, p. 773-780. 7 refs. Contract No. F33615-76-C-5412.

The effects of material and process variables on fatigue behavior were determined for a newly developed, low-cost weldbonding process for the assembly of durable aircraft structures. The weldbonding process involves spot-welding components through a previously applied adhesive, and then oven-curing the assembly to achieve a bonded structure. Both low-load and high-load transfer specimen geometries with each of two alloy combinations (7075-T6/7075-T6 and 2024-T3 alclad/7075-T6) were evaluated. Fatigue behavior of weldbonded specimens with different nugget sizes and different manufacturing defects was compared with that of riveted and adhesive-bonded specimens. In low-load transfer fatigue, weldbonding was better than riveting, but not as good as adhesive bonding, while in high-load transfer fatigue, weldbonding was equal to or better than riveting and adhesive bonding. (Author)

A82-41116 # Minimum induced drag of canard configurations. I. M. Kroo. *Journal of Aircraft*, vol. 19, Sept. 1982, p. 792-794. 10 refs.

Drag estimations are made for an elliptically loaded wing on an aircraft equipped with canards. An analysis of Prandtl's biplane equation, along with Monk's stagger theorem (1921), shows that a minimum induced drag occurs when the total loading is elliptical over the wing span, with lift transferred toward the outboard section of the wings. The section lift of the wing is represented as a Fourier series and a resulting lift distribution defines a minimum induced drag. Prandtl's interference factor is calculated and a nonelliptic interference factor is defined and is used to demonstrate that a substantial reduction in induced drag is possible in comparison with the elliptically loaded case. M.S.K.

A82-41117 # Estimation of the number of in-flight aircraft on instrument flight rules. N. Myerhoff and J. Garlitz (U.S. Department of Transportation, Office of Air and Marine Systems, Cambridge, MA). *Journal of Aircraft*, vol. 19, Sept. 1982, p. 794-796. FAA-supported research.

Mathematical models for estimating the instantaneous aircount (IAC) of aircraft on instrument flight rules flying over the U.S. at any moment are described. The data is gathered from the Official Airline Guide for scheduled great circle paths and projections are made for the location of aircraft at any time of day. The estimates are made independent of radar target reports and cover the regions monitored by each of the 20 air route traffic control centers on the continent. Noting that arrivals and departures are approximately equal from individual centers' jurisdiction at any moment, probabilities are generated for the presence of an aircraft in any given time interval, and a standard profile is employed in regions where a specific flight profile is unknown. Accuracy has been shown to be within 10% during peak hours. M.S.K.

A82-41140 Recommended practice for a demonstration of Nondestructive Evaluation /NDE/ reliability on aircraft production parts - Introduction to the guidelines. W. D. Rummel (Martin Marietta Aerospace; Denver, CO). *Materials Evaluation*, vol. 40, Aug. 1982, p. 922-932.

Guidelines for a demonstration of Nondestructive Evaluation (NDE) reliability on aircraft production parts have been compiled in order to promulgate recommended practices for the development of repeatable data in fracture mechanics applications. Such practices are designed to demonstrate the capabilities of various NDE methods for the detection of flaws in specific materials or parts under routine production inspection conditions. The intent of the guidelines is to define the limiting flaw size which can be detected within a given probability of detection and with a given percent of confidence in that probability. The outline presented encompasses operational requirements, the acquisition and reduction of data, and requalification procedures. O.C.

A82-41141 Evaluation of heat damage to aluminum aircraft structures. D. J. Hagemaier (Douglas Aircraft Co., Long Beach, CA). *Materials Evaluation*, vol. 40, Aug. 1982, p. 962-969. 15 refs.

Examinations of heated surface discoloration or distortion, eddy current conductivity comparison tests and hardness tests are used to evaluate the degree of heat damage incurred by aluminum alloy aircraft structures. Data from articles and reports on the exposure of 7075-T6 and 2024-T3/T4 aluminum alloy sheet materials to elevated temperatures for extended periods of time are considered, and portable hardness and eddy current test equipment for damage assessment are described with attention to significant variables affecting conductivity readings. The data presented suffice for the substantiation of a direct relationship between conductivity, hardness and strength which will allow the evaluation of heat or fire damage in heat-treatable aluminum alloys. O.C.

A82-41447 # Visual scene simulation concerning the landing of sporting aircraft in connection with investigations regarding the control and learning behavior of the pilot (Sichtsimulation der Landung von Sportflugzeugen im Hinblick auf Untersuchungen zum Regler- und Lernverhalten des Piloten). W. Heumann. Darmstadt, Technische Hochschule, Fachbereich Regelungs- und Datentechnik, Dr.-Ing. Dissertation, 1980. 268 p. 89 refs. In German. Research supported by the Deutsche Forschungsgemeinschaft.

The present investigation is concerned with the behavior of man as controller in a technical system. The object of the studies, which were conducted with the aid of a simulator providing a visual scene presentation, is the control of the longitudinal motion of a sporting aircraft during the last phases of a landing under visual flight conditions. Attention is given to the behavior of flying students, taking into account differences in the behavior of students and experienced pilots. Changes in the behavior of the student in connection with advances related to the learning process are examined. The landing simulation system employed provides a presentation of the visual environment of the pilot during the landing procedure, and, in addition, also a lateral view of the landing aircraft. This approach has certain advantages for the student from a didactic point of view. The analysis of the flight path with the aid of the simulator makes it possible to develop a basic model which is typical for a landing performed by an experienced pilot. G.R.

A82-41453 # Investigations concerned with shifting pilot activities to a higher hierarchical stage of flight control (Untersuchungen zur Verlagerung der Pilotentätigkeit auf eine höhere hierarchische Stufe der Flugführung). P. Sundermeyer. Braunschweig, Technische Universität, Fakultät für Maschinenbau und Elektrotechnik, Dr.-Ing. Dissertation, 1980. 120 p. 26 refs. In German.

Advantages and drawbacks of the automation of flight control systems are discussed, taking into account various hierarchical planes. The result of this system analysis is the concept of an aircraft guidance computer for the onboard four-dimensional flight path calculation and generation. The developed computer system becomes a component of an integrated flight guidance system. The computer makes it possible to conduct studies by which the activities to be performed by the pilot are raised to a higher level, involving the solution of coordination problems. The computer calculates possible alternatives regarding the flight path for the aircraft. The pilot makes the final decision on the basis of the information provided by the computer. In addition to performing a calculation of the flight path, the computer provides a representation of the flight path on a map display, time control information, and flight guidance activities (four-dimensional) with respect to different stages of automatization. G.R.

A82-41575 † High-sensitivity holographic plates PL-3M (Vysokochuvstitel'nye gologroficheskie plastinki PL-3M). L. Ia. Kaplun, E. F. Klimzo, and E. N. Sergeeva (Vsesoiuznyi Gosudarstvennyi Nauchno-Issledovatel'skii i Proektnyi Institut Khimiko-Fotograficheskoi Promyshlennosti, Moscow, USSR). *Zhurnal Nauchnoi i Prikladnoi Fotografii i Kinematografii*, vol. 27, July-Aug. 1982, p. 293-295. 8 refs. In Russian.

High-sensitivity holographic plates have been obtained by using spectrally sensitized ultrafine-grained emulsion with pAg = 6.8. The plates, designated PL-3M, have a light sensitivity of 100 erg/sq cm and a diffraction efficiency of 4.3%. The high-sensitivity holographic plates are currently used in research concerned with holographic interferometry of aircraft structures, development of holographic memory devices, stress and strain analysis of structures and materials, lens testing, and optical recording of analog information. V.L.

30 percent of the accidents reviewed. Upper torso restraints, in the few instances used, were beneficial, and had they been used by all occupants, would have significantly reduced the injuries. The report discusses the relation of the occupant to the seat and restraint system and the apparent benefit to be derived from a well-designed impact attenuating seat and, in particular, use of an upper torso restraint. Author (GRA)

N82-29276# Federal Aviation Administration, Atlantic City, N.J.
REDUCTION AND ANALYSIS OF MODE C ALTITUDE DATA COLLECTED AT HIGH ALTITUDES OVER THE CONTINENTAL UNITED STATES Final Report, Sep. 1977 - Apr. 1978
Robert Rigolizzo Mar. 1982 101 p refs
(AD-A114655; DOT/FAA/CT-81/53; DOT/FAA/EM-82/9)
Avail: NTIS HC A06/MF A01 CSCL 01/2

This report describes the reduction and analysis of mode C altitude data collected over the en route centers of Cleveland, Ohio; Memphis, Tennessee; and Albuquerque, New Mexico. The data were gathered under the aegis of the separation standards program primarily for the study of lateral navigation performance over the continental United States at high altitudes. This study provides a procedure for estimating the vertical flight technical error as evidenced from mode C altitude data recorded at the en route centers. It does not account for basic altimeter system error or flight technical error biases and/or fluctuations that are not observable in the ground-derived mode C reported altitude. The data are fitted to six different analytical distributional forms. The effect that data quantization has on the estimation of the parameters of the distributions is examined. Then statistical tests are performed to evaluate the appropriateness of each distributional model in representing the histogram of the mode C deviations. A preliminary analysis is conducted to investigate the association between mode C altitude and aircraft environmental performance characteristics commonly utilized in evaluating separation criteria, as well as identifying aircraft attributes that are of major interest when evaluating vertical flight technical error. Author (GRA)

N82-29277# Clemson Univ., S.C. Dept. of Industrial Management.
MAXIMIZING SOUTH CAROLINA'S AVIATION RESOURCES: IDENTIFYING POTENTIALLY PROFITABLE COMMUTER AIRLINE ROUTES, VOLUME 2
Clinton H. Whitehurst, Jr., Mark A. McKnew, Michael W. Broadway, and Gayle H. Taylor Oct. 1981 168 p refs
(Grant EDA-04-06-03042-40)
(PB82-139353; EDA-81-0132) Avail: NTIS HC A08/MF A01 CSCL 01B

The commuter airline routes within South Carolina were analyzed. It is concluded there are, in fact, a number of potentially profitable commuter airline routes between communities within South Carolina and interstate routes tying some communities in the State to medium and large hub airports. There is however, still work to be done. As communities grow in size and should air service to the State by trunk carriers decline further, it would be well worth it for a community to reevaluate its potential to support commuter service in terms of the profitability criteria outlined in this study. GRA

N82-29278# National Transportation Safety Board, Washington, D. C. Bureau of Technology.
ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA: US GENERAL AVIATION CALENDAR YEAR 1979
5 Nov. 1981 213 p
(PB82-136250; NTSB-ARG-81-1) Avail: NTIS HC A10/MF A01 CSCL 01B

Aircraft accidents which occurred in U.S. general aviation operations during the calendar year 1979 are summarized. It includes an analysis of accident data involving an overview, types of accidents, accidental causal factors, kind of flying, and conclusions; a statistical compilation of accident information presented in the form of accident and rate tables, analytic tables, injury tables and cause/factor tables. These statistical data are divided into sections pertaining to all operations, small fixed-wing aircraft, large fixed-wing aircraft, rotorcraft, gliders, and collisions between aircraft. In 1979, there were 4,023 total general aviation accidents, 678 of which were fatal. Included in the total number of accidents are 40 collisions between aircraft. Author

N82-29279# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
AIRCRAFT FIRE SAFETY
May 1982 174 p refs Presented at AGARD Lecture Series, Oslo, 7-8 Jun 1982 and London, 10-11 Jun. 1982 and Washington, 15-16 Jun. 1982
(AGARD-LS-123; ISBN-92-835-1424-6) Avail: NTIS HC A09/MF A01

Progress in aerospace science and technology, especially pertaining to aircraft safety was reported. The goals of the international organization are to: strengthen common defense posture, improve international cooperation in research and development, provide scientific and technical advance to NATO in aerospace R&D, increase scientific and technical potential and recommend effective use of R&D capabilities. The following topics are discussed: aircraft fire mishap experience/crash fire scenario quantitation; human response to fire; aviation fuels, future outlook and impact on aircraft fire threat; fuel system protection methods; fireworthiness of transport aircraft interior systems; the development and application of a full scale wide body test article to study the behavior of interior materials during a postcrash fuel fire; aircraft postcrash fire reduction/survivability enhancement from a manufacturer's viewpoint; and aircraft postcrash fire fighting/rescue. For individual titles, see N82-29280 through N82-29287.

N82-29280# Federal Aviation Administration, Washington, D.C. Engineering Analysis Branch.
AIRCRAFT FIRE MISHAP EXPERIENCE/CRASH FIRE SCENARIO QUANTITATION
Thomas G. Horeff *In* AGARD Aircraft Fire Safety May 1982 6 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

Civil and military turbine aircraft accidents were reviewed. It was confirmed that the major postcrash fire hazard was caused by ignition of fuel released from wing separation failured during impact survivable accidents. General scenarios for postcrash fire hazards are described and heat flux levels and cabin airflow rates based on fuselage postcrash fire tests are suggested. Fire fatalities to fire tests are suggested. Fire fatalities to fire scenarios and fire experience data base through 1979 are related. It is concluded that the reduction of postcrash fire gives the greatest potential for improved crashworthiness and increased occupant survivability. E.A.K.

N82-29281# Army Aeromedical Research Lab., Fort Rucker, Ala.
HUMAN RESPONSE TO FIRE
Stanley C. Knapp and Francis S. Knox, III *In* AGARD Aircraft Fire Safety May 1982 19 p (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

Human survival in aircraft fire was investigated. Aircraft fires and human survival in thermophysical dimensions and aircraft fire properties, chemical and toxic nature of fibres, the concept of worst credible environment, and survival time dimension derived from ground and airborne fire suppression are discussed. The epidemiology of human fire morbidity and mortality are divided into: (1) no personal protection, no prevention of fire; (2) inadequate protection, no prevention of fire; and (3) prevention of fire and good protection. Assessment techniques to select fabric for protective clothing are examined. Physical and biomedical bases to formulated strategies for the development of aircraft fire prevention and personal protection which leads to increased human survival is constructed. E.A.K.

N82-29282# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio. Aero Propulsion Lab.
AVIATION FUELS-FUTURE OUTLOOK AND IMPACT ON AIRCRAFT FIRE THREAT
A. V. Churchill *In* AGARD Aircraft Fire Safety May 1982 17 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

The properties of aviation turbine fuels with respect to aircraft fire safety are described. It is indicated that projections of the availability of petroleum crudes specifications for aviation turbine fuels may have to be modified to use fuels produced from shale oil, heavy oils and coal. Projections of the chemical and physical properties of future aviation fuels produced from these alternative sources are discussed and compared with present fuels. Progress on programs to develop fire safe fuels through the use of antimisting additives is also described. E.A.K.

N82-29283# Royal Aircraft Establishment, Farnborough (England). Engineering Physics Dept.
FUEL SYSTEM PROTECTION METHODS
H. W. G. Wyeth *In* AGARD Aircraft Fire Safety May 1982 16 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

A fuel system protection equipment for military aircraft and helicopters, to reduce fires and explosions which occur under combat conditions was developed. Equipments are available for fitment to civil transport for survivability enhancement. It is recommended that aircraft fire safety and crash resistance in the initial design and appropriate safety precautions taken to minimize the risk of fire and explosion both in flight and on the ground should be considered. It is concluded that fuel containment systems and antimisting fuels can reduce dynamic fuel spillage and improve occupant survivability in postcrash fire. E.A.K.

N82-29284*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIREWORTHINESS OF TRANSPORT AIRCRAFT INTERIOR SYSTEMS
John A. Parker and D. A. Kourtides *In* AGARD Aircraft Fire Safety May 1982 17 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

The fire worthiness of air transport interiors was evaluated. The effect of interior systems on the survival of passengers and crew in an uncontrolled transport aircraft fire is addressed. Modification of aircraft interior subsystem components which provide improvements in aircraft fire safety are examined. Three specific subsystem components, interior panels, seats and windows, offer the most immediate and highest payoff by modifying interior materials of existing aircrafts. It is shown that the new materials modifications reduce the fire hazards because of significant reduction in their characteristic flame spread, heat release, and smoke and toxic gas emissions. E.A.K.

N82-29285# Federal Aviation Administration, Atlantic City, N.J. Fire Safety Branch.
THE DEVELOPMENT AND APPLICATIONS OF A FULL-SCALE WIDE BODY TEST ARTICLE TO STUDY THE BEHAVIOR OF INTERIOR MATERIALS DURING A POST-CRASH FUEL FIRE
Constantine P. Sarkos, Richard G. Hill, and Wayne D. Howell *In* AGARD Aircraft Fire Safety May 1982 21 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

The full scale, wide body test article was developed to study postcrash cabin fires. Applications of the C-133 article are described as follows: (1) capabilities and instrumentation; (2) derivation of fuel fire test conditions based on physical modeling and fire tests; (3) characterization of cabin fire hazards which result from exposure of wide body interior materials to external fuel fire; and (5) evaluation of effectiveness of urethane seat cushion fire blocking layers and improved cushioning materials. It is shown that cabin hazards and parameters associated with postcrash fire can be realized by use of improved materials. E.A.K.

N82-29286# British Aerospace Aircraft Group, Bristol (England). Fire Precautions Engineering Dept.
AIRCRAFT POST CRASH FIRE REDUCTION/SURVIVABILITY ENHANCEMENT FROM A MANUFACTURER'S VIEWPOINT
T. Madgwick *In* AGARD Aircraft Fire Safety May 1982 23 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

The importance of achieving a balanced level of overall safety for flight and crash situations are outlined. Research and development in the area of external fire effects and occupant escape is evaluated. The crashworthiness requirements developed for the SST and the means of compliance are outlined. Cabin interior material combustion hazards are discussed. Visibility tests in a smoke filled cabin and the relative importance of toxicity effects in hindering escape are assessed. E.A.K.

N82-29287# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany). Inst. fuer Antriebstechnik.
AIRCRAFT POST-CRASH FIRE FIGHTING/RESCUE
R. Fiala *In* AGARD Aircraft Fire Safety May 1982 27 p refs (For primary document see N82-29279 20-03)
Avail: NTIS HC A09/MF A01

The correlation between specific extinguishing time and the size of the burning fuel area was calculated. The influence of fuel properties, the boiling temperature and viscosity on extinguishing efficiency of foams is described. An extinguishing technique which considers the dependence of extinguishing efficiency on the foam properties is presented. The requirements for foam monitors are shown. The break up of foam jets, produced by foam monitors is discussed. The extinguishing efficiency with the combined application of dry powder halon and foam and the advantages of a combined use when there is only a pool fire are outlined. E.A.K.

N82-29288*# Princeton Univ., N. J. Flight Research Lab.
DEVELOPMENT OF FLYING QUALITIES CRITERIA FOR SINGLE PILOT INSTRUMENT FLIGHT OPERATIONS Interim Report, Sep. 1979 - May 1981
Aharon Bar-Gill, W. Barry Nixon, and George E. Miller Jun 1982 167 p refs
(Contract NAS1-15764)
(NASA-CR-165932; NAS 1.26:165932; MAE-1528) Avail: NTIS HC A08/MF A01 CSCL 17G

Flying qualities criteria for Single Pilot Instrument Flight Rule (SPIFR) operations were investigated. The ARA aircraft was modified and adapted for SPIFR operations. Aircraft configurations to be flight-tested were chosen and matched on the ARA in-flight simulator, implementing modern control theory algorithms. Mission planning and experimental matrix design were completed. Microprocessor software for the onboard data acquisition system was debugged and flight-tested. Flight-path reconstruction procedure and the associated FORTRAN program were developed. Algorithms associated with the statistical analysis of flight test results and the SPIFR flying qualities criteria deduction are discussed. N.W.

N82-29290# Federal Aviation Administration, Washington, D.C. Office of Aviation Medicine.
EFFECTS OF APPROACH LIGHTING AND VARIATION IN VISIBLE RUNWAY LENGTH ON PERCEPTION OF APPROACH ANGLE IN SIMULATED NIGHT LANDINGS
Henry W. Mertens and Mark F. Lewis Feb. 1982 21 p refs
(AD-A114742; FAA-AM-82-6) Avail: NTIS HC A02/MF A01 CSCL 01/2

Previous experiments have demonstrated illusions due to variations in both length and width of runways in nighttime 'black hole' approaches. Even though approach lighting is not designed to provide vertical guidance, it is possible that cues from approach lights could interact with cues from runway lighting to reduce illusions due to variation in runway size. Two experiments were conducted to evaluate the effect of approach lighting on perception of approach angle in simulated night approaches. In the first experiment, 40 pilots made simulated visual approaches to a 150- by 6,000-ft runway with and without a 3,000-ft approach light system (ALSF-2). Pilots controlled a moving runway model to produce a constant 'normal' angle of approach over the distance range of 23,000 ft to 8,000 ft from threshold. In the second experiment, 24 pilots made simulated approaches to a 150- by 6,000-ft runway which was either fully visible or which had lights of the upwind half occluded. In addition, a 1,400-ft abbreviated approach light system (SSALS) was used at three intensities. Decreasing the visible length of the runway by occulting lights of the far half increased mean generated approach angles from 2.2 deg to 2.7 deg in agreement with results of a previous experiment involving similar lengths of runways. Neither the presence of equal intensity approach lights nor uncomfortable glare from approach lights 20 times brighter than runway lights had an effect of practical significance on responses. These findings reinforce previous experimental demonstrations of the importance of runway size cues related to varying runway length, and also show that potential size cues provided by approach lights do not prevent illusions due to variations in runway size. GRA

N82-29291# SRI International Corp., Menlo Park, Calif.
TERMINAL INFORMATION DISPLAY SYSTEM BENEFITS AND COSTS Final Report
Waheed Siddiqee, Janet Tornow, and Mina Chen Washington FAA Mar. 1982 79 p refs
(Contract DOT-FA-79-WA-4344)
(AD-A114937; FAA-APO-82-4) Avail: NTIS HC A05/MF A01 CSCL 17/7

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von Geschwindigkeitsverteilungen im Vorderkantenwirbel eines Deltaflugels mit dem Laser-Doppler-Verfahren). K. Anders (Institut fur Thermodynamik der Luft- und Raumfahrt, Stuttgart, West Germany) and E. Wedemeyer (Institut von Karman de Dynamique des Fluides, Rhode-Saint-Genèse, Belgium). In: Symposium on Flows with Separation, Stuttgart, West Germany, November 23-25, 1981, Reports. (A82-38781 19-02) Cologne, Deutsche Gesellschaft fur Luft- und Raumfahrt, 1982. 11 p. In German.

It is pointed out that there are significant differences between the flow around a delta wing and the flow observed in the case of a conventional wing with a large aspect ratio. Vortex formation at the leading edges of delta wings produces nonlinear additional lift. Under certain conditions, a complete change of the form of the flowfield will occur above a part of the wing, and the vortex will burst. Pronounced turbulent mixing takes place, and the supersonic speed is significantly reduced. This reduction leads to a considerable decrease of the lift. Ludwieg (1960) has discussed a theory which explains the bursting process with an occurrence of instabilities. The present investigation is concerned with a study of leading edge vortices on the basis of Ludwieg's theory. Certain deviations of experimental data from results obtained on the basis of Ludwieg's theory can, perhaps, be explained by the unsymmetrical character of the vortex near the wall.
G.R.

A82-38922 Calculation of level flow using radial grating (Berechnung der ebenen Strömung durch rotierende Radialgitter). E. M. Steck (Karlsruhe, Universität, Karlsruhe, West Germany). *(Gesellschaft für angewandte Mathematik und Mechanik, Wissenschaftliche Jahrestagung, Würzburg, West Germany, Apr. 21-24, 1981.) Zeitschrift für angewandte Mathematik und Mechanik*, vol. 62, Apr. 1982, p. T 233-T 235. In German.

A theoretical study of level flow through a rotating radial grating is conducted for the special case of ideal flow as well as for laminar flow in a high-viscosity newtonian fluid. A system of equations and correlative boundary conditions are developed in order to obtain the frictional and friction-free flow in the form of the integral values of the pressure and efficiency as functions of volume, blade number, Reynolds number, blade angle variation, and radian ratio.
C.D.

A82-38937 # A recursive terrain height correlation system using multiple model estimation techniques. G. L. Mealy and W. Tang (Analytic Sciences Corp., Reading, MA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 105-112. 7 refs. Grant No. DAKK80-79-C-0266. (AIAA 82-1513)

This paper describes the results of an investigation of the performance capabilities of an extended Kalman filter (EKF) based recursive terrain correlation system proposed for low-altitude helicopter navigation. The major disadvantage of this concept is its sensitivity to initial position error. One method for reducing this sensitivity involves the use of multiple model estimation techniques. In the multiple model approach, a bank of identical EKFs, each of which is initialized at a different point in the a priori uncertainty basket, is employed to ensure that one filter is initialized near the true aircraft position. In this manner, the probability of filter convergence is increased substantially, leading to improved navigation performance.
(Author)

A82-38938 # PNCS - A commercial flight management computer system. M. W. Bird (Lear Siegler, Inc., Instrument Div., Grand Rapids, MI). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 113-123. 5 refs. (AIAA 82-1515)

The Performance Navigation Computer System (PNCS), a system in which performance optimization, multisensor navigation, automatic guidance, and display techniques have been integrated to provide fuel-efficient operation and a lower workload for the crew is described. The PNCS guidance and flight planning capabilities derive from the integration of the optimum speed and altitude profiles computed by the performance management function with the lateral path and speed/altitude constraints of the flight plan. The performance management functions determine the climb, cruise, and descent profile segments that minimize the total trip cost, while lateral, vertical, and speed commands are fed to the autopilot and autothrottle for automatic guidance to the optimized profile. The navigation data base of the PNCS, which contains airport, route, and navigation aid data, simplifies the selection and modification of flight plans.
C.R.

A82-38939 # Air-to-air missile avoidance. G. A. Mandt and T. L. Neighbor (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 124-131. 12 refs. (AIAA 82-1516)

A methodology for developing real-time missile avoidance trajectories is presented. The steps are as follows: analyzing missile systems for vulnerabilities, determining the tactics to exploit these vulnerabilities, and testing the tactics against missile simulations to determine the location and extent of maneuver effectiveness. It is noted that these maneuvers could then be placed into an on-board computer for real-time missile avoidance. Also presented is a table look-up approach. This approach permits maneuvering at longer ranges, appears better able to handle a multiple missile scenario as compared with an optimal control algorithms, and appears more feasible to implement.
C.R.

A82-38940 # Pilot models for discrete maneuvers. R. K. Heffley (Systems Technology, Inc., Mountain View, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 132-142. 17 refs. (AIAA 82-1519)

Discrete maneuvers comprise a class of piloting tasks which can include fixed-wing landing flare; gross change of heading, altitude, or airspeed; helicopter or VTOL transition to hover; and helicopter nap-of-the-earth dash and quick-stop. While these maneuvers may appear to differ fundamentally from basic tracking tasks, pilot models can be constructed using the same mathematical forms. Several examples of discrete-maneuver pilot models are presented along with accompanying flight and simulator data. The value of such models is discussed with regard to handling qualities, simulator fidelity, and pilot training. The main benefit is the ability to exploit pilot-in-the-loop analysis more effectively by formulating a complete pilot-vehicle-task context.
(Author)

A82-38941 # Design and flight testing of digital direct side-force control laws. S. L. Grunwald (USAF, Washington, DC) and R. F. Stengel (Princeton University, Princeton, NJ). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 143-151. 15 refs. Contract No. N00014-78-C-0257. (AIAA 82-1521)

Three-input/three-output command augmentation control laws designed and tested in flight using Princeton University's variable-response research aircraft are discussed. It is noted that the controllers were based on algebraic model-following, a fast and efficient method of direct digital synthesis for advanced control modes. Pilot opinions of several command modes and controller-to-command pairings are presented here. Flat turns, lateral translation, and roll control are investigated. Of the command modes tested, foot pedals-to yaw rate, lateral stick-to-roll rate, and thumb lever-to-sideslip angle are found to give the best overall ratings.
C.R.

A82-38942 # Simulator investigations of various side-stick controller/stability and control augmentation systems for helicopter terrain flight. E. W. Aiken (U.S. Army, Aeromechanics Laboratory, Moffett Field, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 152-164. 15 refs. (AIAA 82-1522)

Two piloted simulator experiments were conducted to assess the effects of side-stick-controller characteristics and level of stability and control augmentation on handling qualities for helicopter terrain flight. A composite of several evaluation tasks was flown with the aid of a head-up display of flight-control symbology. Variations in force-deflection characteristics and the number of axes controlled through a side-stick were investigated. Satisfactory handling qualities were achieved with a two-axis displacement controller and angular rate stabilization. Attitude stabilization was required to maintain adequate handling qualities for either a three- or four-axis rigid controller.
(Author)

A82-38943 * # The effects of the delays on systems subject to manual control. R. A. Hess (NASA, Ames Research Center, Moffett Field, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 165-172. 13 refs.

Results are presented of an experimental study to determine the effects of time delays in manual control systems. A simple, fixed-base laboratory simulation facility is used for determining pilot dynamics and tracking performance in a series of single-axis, compensatory tracking tasks. In these tasks, three time-delay values and three controlled-element dynamics are used. The delays are chosen to encompass values encountered in experimental and operational aircraft. It is noted that the controlled-element dynamics replicate those found in many previous manual control studies, that is, the classical displacement, rate, and acceleration control systems. The experimental effort is complemented with an analytical pilot modeling study where the parameters of a structural model of the human pilot are adjusted so as to provide excellent matches to the experimentally determined pilot dynamics. The experimental and analytical studies both indicate that time delays cause significant changes in pilot equalization requirements.
C.R.

A82-38944 * # Modal control of relaxed static stability aircraft. R. H. Rooney, J. C. Chung, and E. Y. Shapiro (Lockheed-California Co., Burbank, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 173-176. Contract No. NAS1-15326. (AIAA 82-1524)

A method is developed that assigns a selected portion of a closed loop system eigenstructure in accordance with certain desirable criteria. The method is applied here to a relaxed static stability aircraft, the goal being to synthesize a control law that provides the unstable aircraft with handling qualities equal to or better than those of a comparable statically stable aircraft. It is shown that by using the target system eigenstructure, good flight characteristics are achieved by the unstable aircraft. It is also shown that improved characteristics can be obtained by assigning an orthogonal eigenvector structure. C.R.

A82-38954 # **An X-Wing aircraft control system concept.** A. J. Potthast (Lockheed-California Co., Burbank, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 257-265. 13 refs. (AIAA 82-1540)

X-Wing aircraft technology development has, as an ultimate goal, a Vertical Take-Off and Landing (VTOL) aircraft with fast tactical response, long range, and high speed that can be operated from frigates and large destroyers. The proposed aircraft combines a circulation control air rotor/wing and control system with a conventional aircraft fuselage and 'fan-in-fin' tail. Cyclic and collective modulation of rotor/wing circulation control air combined with rotor/wing hub moment feedback and conventional feedback provides continuous stability and control during rotary, conversion, and fixed wing modes of flight. The control concept is described and test results from full and 1/4-scale models are compared with predicted data. Conclusions are drawn relative to concept application to the X-wing aircraft. (Author)

A82-38959 # **A design criterion for highly augmented fly-by-wire aircraft.** C. R. Abrams (U.S. Navy, Air Development Center, Warminster, PA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 410-419. 8 refs. (AIAA 82-1570)

The present investigation is concerned with a versatile control criterion for highly augmented fly-by-wire aircraft which can provide optimized mission-oriented performance. Based on an optimization process for a second order system, a Time Response Parameter (TRP) has evolved which can be adapted to a variety of mission phases and new flight modes. The TRP approach has demonstrated definite trends with both Pilot Ratings and Pilot Induced Oscillation Ratings, and is also compatible with other transient response criteria. The TRP criterion can be readily applied to high order, nonlinear, and multivariable control systems, and is easily computerized for continuous evaluation of control system design. It is pointed out that the use of such criteria will promote the utilization of military aircraft as a weapons platform through more effective flight control design. G.R.

A82-38960 # **Generic faults and design solutions for flight-critical systems.** S. S. Osder (Sperry Flight Systems, Phoenix, AZ). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 509-518. 17 refs. (AIAA 82-1595)

The term 'generic fault' is employed to describe design defects which elude the test and analysis procedures used to validate a redundant control system design. Although the existence of such defects can be postulated in any type of system, the generic fault concept is especially significant in the flight-critical system application because it defeats the massive redundancy strategies which designers rely on to meet safety or reliability objectives. Various types of generic faults are examined, taking into account computation and scaling, timing, logical errors, hardware and firmware defects, latent failure effects, and aspects of real-time clock failure. A description is presented of solutions using decoupled, nonsynchronous architectures. It is found that dissimilar redundancy and brick-wall separation strategies are viable approaches to overcome generic-fault vulnerabilities. Their implementation requires unsynchronized channel operation. G.R.

A82-38961 * # **The use of differential pressure feedback in an automatic flight control system.** D. W. Levy, J. Roskam, and P. D. Finn (Kansas University Center for Research, Inc., Flight Research Laboratory, Lawrence, KS). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 519-524. Grant No. NAG4-5. (AIAA 82-1596)

A feasibility study has been performed to evaluate the performance of a system whereby a control surface is positioned with differential pressure as the feedback variable. Analogous to a position command system, the control surface is commanded to move until a certain differential pressure is achieved at a given point on the surface. Frequency response tests and theoretical considerations indicate that the pressure feedback transfer function is first order, with a break frequency up to 50 rad/sec. There exist applications to the outer loops of flight control systems as well. Stability augmentation, gust alleviation, and stall prevention appear to be possible by feeding back differential pressure across lifting and control surfaces. (Author)

A82-38962 # **A preliminary laboratory evaluation of a reconfigurable integrated flight control concept.** A. P. DeThomas (USAF, Flight Dynamics Laboratory, Wright-Patterson AFB, OH) and S. C. Goel (Systems Control Technology, Inc., West Palm Beach, FL). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 525-530. 5 refs. (AIAA 82-1597)

The present investigation is concerned with the concept of virtual redundancy as a means of maintaining the reliability of the flight control function within an integrated architecture. Virtual redundancy involves the reconfiguring of the system resources to create redundancy on demand. Virtual redundancy is invoked by the system executive by causing some known good processor to compute a solution which can break the tie between disagreeing processors. An implementation in software for the case of Virtual Flight Control redundancy is discussed. Attention is given to an examination of virtual redundancy as a means of fault isolation for cross-channel monitoring when only two signals are present, a general assessment of the feasibility of virtual redundancy and system reconfiguration to enhance coverage and recover function lost due to failures, redundancy management, and failure detection and isolation. G.R.

A82-38966 # **The ideal controlled element for real airplanes is not K/s.** C. R. Chalk (Calspan Corp., Buffalo, NY). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 556-560. (AIAA 82-1606)

The early experiments performed to generate data to support development of mathematical models of the human operator used simple controlled element transfer functions, including K, and K/s. However, when the physical system being controlled has mass and the response state being controlled is position, the K and K/s transfer function forms are physically impossible because infinite acceleration capability would be required for abrupt commands. It is found that the roll angular acceleration and the lateral linear accelerations at the pilot station are important considerations in flying qualities. The angular and linear accelerations can become objectionably high when the roll damping is very high and the height above the X stability axis is large. It is pointed out that roll ratchet is best explained by a model that assumes the pilot is closing the aileron loop on angular acceleration response cues. G.R.

A82-38968 # **An alternate method of specifying bandwidth for flying qualities.** J. Hodgkinson, J. R. Wood (McDonnell Aircraft Co., St. Louis, MO), and R. H. Hoh (Systems Technology, Inc., Hawthorne, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 571-578. 6 refs. (AIAA 82-1609)

It is pointed out that the task of predicting the flying qualities of a modern fighter aircraft has been complicated by the use of highly augmented control systems. Control systems intended to improve flying qualities have often degraded them instead. These degradations were unexpected because the criteria used to predict the aircraft's flying qualities were invalid, or were incorrectly interpreted, for augmented aircraft. Therefore, in the 'Proposed MIL Standard/Handbook - Handling Qualities of Piloted Airplanes', criteria for augmented aircraft are emphasized. The bandwidth criterion specifies the quality of aircraft attitude dynamics. A refined version of the bandwidth criterion is proposed. The new version offers two specific advantages as compared with the original version. It deals with the bandwidth sensitivity problem and, by using a Nichols chart, it encourages the designer to view the entire open- and closed-loop frequency responses simultaneously. G. R.

A82-38969 # **Investigation of low order lateral directional transfer function models for augmented aircraft.** D. E. Bischoff and R. E. Palmer (U.S. Naval Material Command, Naval Air Development Center, Warminster, PA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926 19-18) New York, American Institute of Aeronautics and Astronautics, 1982, p. 579-586. 11 refs. (AIAA 82-1610)

The high order transfer functions representing the lateral directional responses of augmented aircraft to pilot control inputs were matched in the frequency domain with two candidate low order equivalent forms: (1) the complete three degree of freedom representation of roll and sideslip angle responses, and (2) the single degree of freedom roll mode and Dutch roll approximations. Acceptable models were generally obtained for both forms. Simultaneous matching of sideslip and roll angle responses and/or a priori information for the roots was required to match the full three degree of freedom forms. The equivalent system models are discussed in terms of their match statistics and their model parameters are compared against the requirements of the military flying-qualities specification. (Author)

A82-38970 * # **An analysis of a nonlinear instability in the implementation of a VTOL control system during hover.** J. M. Weber (NASA, Ames Research Center, Moffett Field, CA). In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. (A82-38926

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Zhestovskii, and V. Ia. Bratchik. *Problemy Prochnosti*, Aug. 1982, p. 90-93. 9 refs. In Russian.

The efficiency of various schemes and methods for analyzing plates, shells, and three-dimensional structures is examined in order to select appropriate mathematical models for incorporation into a computer-based system for designing aircraft engine rotors. It is shown that at the stage of preliminary design studies, the analysis of rotor components can be carried out in the approximation of axisymmetric plates and shells. Rotor design modules are developed which can be used within the automated design system or autonomously. V.L.

A82-42474 # **The Power Pair Locus - A preliminary design aid to select power ratings for multi-engined helicopters.** A. L. Neuburger (Pratt and Whitney Aircraft of Canada, Ltd., Longueuil, Quebec, Canada). *Canadian Aeronautics and Space Journal*, vol. 28, Mar. 1982, p. 56-64.

Multi-engine passenger carrying helicopters require an engine emergency rating whose magnitude affects the economics of the vehicle. The Power Pair Locus is introduced as an optimization tool suitable for initial vehicle/engine design iterations. It represents pairs of takeoff and emergency power and it is based on a creep wear criterion for the critical turbine blade such that engine qualification requirements are satisfied. Modification of these requirements has been explored and a 10% reduction in engine size appears feasible if only 1/4% of the endurance test time is spent at the emergency rating instead of the 4% which is currently required. For cooled blades, increased cooling tends to reduce the engine's emergency to takeoff power ratio. (Author)

A82-42504 **Use of aircraft-derived data to assist in ATC tracking systems. I - Accuracy and theoretical considerations.** H. W. Thomas and C. C. Lefas (Manchester, Victoria University, Manchester, England). *IEE Proceedings, Part F - Communications, Radar and Signal Processing*, vol. 129, pt. F, no. 4, Aug. 1982, p. 281-288. 9 refs. Research supported by EUROCONTROL.

The possible uses of currently available aircraft-derived data in assisting in radar tracking are investigated theoretically to establish the accuracies required for such data to improve the performance at present obtained from radar position measurements. For straight-line tracking, it is found that velocity measurements can be obtained by resolving TAS and heading in two axes. Such velocity measurements, however, are biased by the wind to such an extent that they are not directly useful. Even though the straight-line filter may be augmented in order to estimate the wind speed online, and accuracies obtained are not significantly better than those obtained by filtering SSR data only. For maneuvering aircraft, the results obtained suggest that maneuver tracking is possible using either roll-angle or heading measurements. It is noted that use of 'higher-order' measurements such as velocity and acceleration provide considerable benefit during turns and that their incorporation into the tracking algorithm is straightforward. C.R.

A82-42531 # **Adaptation and first cryogenic operation of T2 ONERA/-CERT wind tunnel.** R. Michel and A. Mignosi (ONERA, Centre d'Etudes et de Recherches de Toulouse, Toulouse, France). *La Recherche Aérospatiale* (English Edition) no. 2, 1982, p. 75-85. 5 refs.

A description is given of the transformation of the ONERA/CERT induction-driven transonic wind tunnel into a blowdown, cryogenic wind tunnel which employs high pressure air as a driving gas and nitrogen as a coolant. An analysis of results from the first series of low temperature tests shows that the combination of induction and cryogenics yields steady and well defined low temperature flows at transonic Mach numbers, with temperatures as low as 100 K and Reynolds numbers from 3 million to over 30 million. Attention is given to the design details of the liquid nitrogen supply and injection systems, as well as the performance levels achieved. O.C.

A82-42533 # **An optimum design of fuselage structure.** H.-L. Ding, W.-P. Chen, X.-X. Sun, and W. Fang. *Acta Mechanica Solida Sinica*, May 1982, p. 157-164. 6 refs. In Chinese, with abstract in English.

The application of the improved fully stressed design method to fuselage structure design is presented. The conventional stress and minimum gage constraints as well as the component buckling constraints are studied. For the latter, the oscillation in stress ratio redesign can be effectively damped by means of the 'under-relaxation' factor derived in this paper. In addition to the commonly used bars, panels and beams, some dummy and scalar elements are used to avoid the 'ill-condition' or an idealized model of the complex fuselage structure. The presented computer program includes adjustments to the converged design and a final structural analysis in order to improve reliability. In a sample application of the fuselage structure, the design is basically converged after only five iterations. The converged design is satisfactory and is about eleven percent lighter than the initial one. C.D.

A82-42544 **Aircraft R&D in Europe - A perspective view.** J. C. Wimpenny (British Aerospace Public, Ltd., Co., Aircraft Group, Kingston-upon-Thames, Surrey, England). *(European Pioneer's Day Conference, Toulouse, France, May 6, 7, 1982.) Aeronautical Journal*, vol. 86, Aug.-Sept. 1982, p. 243-251.

Research and development in European civil air transport is considered. It is suggested that industry growth depends primarily on fare reduction, resulting in an increased actual passenger per km figure. A high rate of product improvement implies a reasonable growth rate, but a low rate may reduce the amount of competition. If an excessive rise in fuel prices occurs, R&D will still have to be high in order to reduce direct operating cost (DOC) penalties. A high or low improvement rate for DOC can influence whether future developments are primarily reorders or new types. A steady R&D is essential in order to ensure high DOC reductions, and R&D effectiveness requires precise definition and management. R&D growth must be accompanied by improved profitability of manufacturers and operators. Air traffic management (ATM) can be a major improvement as it provides a 6% potential DOC reduction, and further investigation of ATM is needed. R.K.R.

A82-42545 **A supersonic V/STOL fighter design project.** J. P. Fielding (Cranfield Institute of Technology, Cranfield, Beds., England). *Aeronautical Journal*, vol. 86, Aug.-Sept. 1982, p. 252-258.

Students of the College of Aeronautics of the Cranfield Institute of Technology have designed a V/STOL aircraft, using carbon fiber reinforced plastic construction wherever possible. This material offers weight savings of 15% for wing type components, 16% for fuselage, and 10% for undercarriage, and a mass breakdown of the aircraft is given. The design offers improved lift characteristics for short take-off and combat as it employs a close-coupled canard arrangement. As engine intakes are on top of the rear fuselage, radar cross-section is reduced, area distribution is increased, and inlet duct volume is reduced. Wind-tunnel test of a similar configuration show promising efficiency results for such intakes. Other design considerations presented pertain to wing, fuselage, and powerplant and vertical take-off system design. Particular attention during construction was given to achieving a reduced vulnerability by performing extensive penetration calculations. It is suggested that further development of the powerplant and remote augmented lift system, and investigation of high temperature materials and insulation be done. R.K.R.

A82-42546 **The application of geometric programming to the structural design of aircraft wings.** M. B. Snell and P. Bartholomew (Royal Aircraft Establishment, Dept. of Materials and Studies, Farnborough, Hants., England). *Aeronautical Journal*, vol. 86, Aug.-Sept. 1982, p. 259-268. 6 refs.

The technique of geometric programming is applied to the design of optimum aircraft wings in the multi-spar monolithic skin configuration. Both flat and corrugated web systems are considered and design examples are given based on contemporary wing data. The present report is confined to the consideration of minimum weight design of metallic structure and the constraints are those which arise naturally from consideration of allowable stress, buckling and in some instances geometric limitations on the layout. Most of the problems solved give rise to closed form solutions while more complex problems are readily solved by computer program. (Author)

A82-42547 **Turbulence modelling - Report of a Working Party.** A. B. Haines (Aircraft Research Association, Ltd., Bedford, England). *Aeronautical Journal*, vol. 86, Aug.-Sept. 1982, p. 269-277. 21 refs.

A review of turbulence modelling for aeronautical applications is presented, and recommendations for future progress in the field are suggested. External flow viscous turbulence models are based on boundary-layer development calculations matched with an inviscid-flow solution. Boundary layer calculations derived from the Bradshaw finite difference method require the use of a Reynolds-stress (RS) turbulence model. Internal flow models have lower Reynolds numbers than external; thus, the viscous layers are thicker. Turbulence models for various engine parts such as compressors (basic integral methods), combustion chambers (k-epsilon model), and jets and propulsion installation (k-epsilon model, but with better methods to account for the fluxes of heat and water) are presented. Short-term priority tasks include speeding up computer programs, applying methods to configurations of more complex geometry, and incorporating viscous effects into inviscid methods. R.K.R.

A82-42552 **Modern compressible flow with historical perspective.** J. D. Anderson, Jr., (Maryland, University, College Park, MD). New York, McGraw-Hill Book Co., 1982. 479 p. 80 refs. $33.

The fundamentals of classical compressible flow are reviewed along with modern computational fluid dynamics and high-temperature flows. Topics discussed include integral forms of the conservation equations for inviscid flows, one-dimensional flow, oblique shock and expansion waves, quasi-one-dimensional flow, differential conservation equations for inviscid flows, and unsteady wave motion. Other topics are the velocity potential equation, linearized flow, conical flow, numerical techniques for steady supersonic flow, properties of high-temperature gases, and basic examples of high-temperature flows. V.L.

A82-42565 **Optimisation in multivariable design.** G. F. Bryant. In: Design of modern control systems. (A82-42558 21-63) Stevenage, Herts., England and New York, Peter Peregrinus, Ltd., 1982, p. 159-176. 8 refs.

Three new basic algorithms for achieving diagonal dominance are described: (1) the choice of optimal permutation of input or output variables of the plant; (2)

the optimal choice of scaling factors; and (3) the determination of a real precompensator to optimize the dominance measure of the compensated plant. A linear jet-engine model is considered as a design example. B.J.

A82-42572 **The sporty game.** J. Newhouse. Research supported by the Marshall Fund. New York, Alfred A. Knopf, 1982. 250 p. 70 refs. $15.

An episodic history of the airliner business in the era of widebody airplanes is presented. Competition in the development and marketing of big airplanes is focused on, with each of the major companies being discussed in detail, and the development of international competition emphasized. The relationship of governments to the individual companies is explored, and aspects such as comfort, safety, and aircraft size are evaluated as factors in the competition. Future prospects of the American airplane industry are assessed. C.D

A82-42574 **Automation of flight operational control in the German Democratic Republic (Automatisierung der Flugleitung in der DDR).** W. Raschke (Interflug Gesellschaft für Internationalen Flugverkehr mbH, Berlin, East Germany). *Technisch-ökonomische Information der zivilen Luftfahrt*, vol. 18, no. 2, 1982, p. 63-80. In German.

A description is given of the procedures and the equipment of the subsystem flight operational control of the automated transportation process control system of Interflug. Attention is given to radar data processing and radar data display complexes of Berlin-Schönefeld (Gamma-1). In connection with the employment of modern technological and technical solutions, this system represents a significant step from a manual flight control system to an automated flight control system. The factors which make the automation of flight operational control procedures necessary are examined. They are found to be largely related to a very significant increase in the number of flights which have to be considered. Operational experience regarding the Gamma-1 is also discussed, and plans for additional automation projects are outlined. G.R.

A82-42670 **Design and analysis of advanced composite structures.** R. N. Hadcock (Grumman Aerospace Corp., Bethpage, NY). In: Handbook of composites. (A82-42651 21-24) New York, Van Nostrand Reinhold Co., 1982, p. 533-556. 9 refs.

The iterative final design process in the case of advanced composite structures is generally so complex that it can only be readily accomplished by utilizing a computer. However, the process can be greatly simplified for preliminary design. The present investigation is concerned with a simplified design approach which is quite adequate for preliminary design. The preliminary design of composite structures begins with tradeoffs of the impact of using different types of construction and materials on the weight and cost of either a part or on the total structure associated with an aircraft or space vehicle. Parametric trade studies are discussed, taking into account fuselage weight savings, weight savings for rudders and flaps, weight reductions over metal airframes, and advanced design composite aircraft configurations. Attention is given to multidirectional laminate structural behavior, laminate strength under uniaxial loading, and the preliminary analysis and design of composite panels. G.R.

A82-42675 **Aerospace applications of composites.** G. Lubin and S. J. Dastin (Grumman Aerospace Corp., Bethpage, NY). In: Handbook of composites. New York, Van Nostrand Reinhold Co., 1982, p. 722-743. 16 refs.

It is estimated that within 10 years composites will comprise up to 40 percent of all aircraft structures. This is due to the fact that high performance composites are the only existing materials meeting the requirements for light weight, high strength, high stiffness and good fatigue resistance characteristic of aerospace applications. For example, a graphite composite has a tensile strength of 3.6 x 10 to the sixth in. compared with 0.8 x 10 to the sixth for aluminum, and a fatigue endurance of 80 percent of its static strength, compared with 35 percent for aluminum. Additional advantages over commonly used metals include: superior surface finish, dimensional stability, material uniformity and freedom of aerodynamic design and contouring. Current applications to spacecraft include: rocket nozzles, filament wound tanks and grid-stiffened composite panels. Applications for aircraft currently include wing skins and stabilizers, with static engine components envisioned. A.B.

A82-42722 † **Optimal stream surfaces in supersonic three-dimensional flows (Ob optimal'nykh poverkhnostiakh toka v sverkhzvukovykh prostranstvennykh techeniiakh).** M. P. Levin. *Zhurnal Vychislitel'noi Matematiki i Matematicheskoi Fiziki*, vol. 22, July-Aug. 1982, p. 1003-1008. 9 refs. In Russian.

A numerical solution is obtained for the optimal contouring of the supersonic part of a three-dimensional nozzle in the case when the adjoint problem for the Lagrange multipliers has an analytical solution. Attention is given to the cases of smooth stream surfaces and to cases when the optimality conditions are formulated on the characteristic control surface. The contouring problem is reduced to the solution of a three-dimensional nonlinear system of hyperbolic equations. B.J.

A82-42750 **Europe's best seller - Second-generation Airbus emerges.** *Air International*, vol. 23, Sept. 1982, p. 111-115, 116, 118, 147, 148.

The Airbus A310 is discussed, revealing extensions and modifications of the current design. Intended as a smaller capacity short/medium range transport, it has wide-body twin aisle cabins accomodating between 220-262 passengers, depending on cabin configuration. The basic model employs two turbofan engines with 22,680kgp each, and has an operating range that varies from 1,250-2,800 naut miles. Another model having a range of 3,750 naut miles and accomodating 218 passengers is likely to be introduced. Changes made in the wing design represent an extension of ideas about supercritical airfoils and peaky sections employed in the A300 wing. The main improvement is that the shock wave has been pushed back along the chord of the wing, delaying the compressibility drag rise and increasing rear loading, giving a substantial increase in the lift carried by the wing. While the span and the sweepback remain unchanged, the aspect ratio was increased from 7.73 to 8.8. As a result of improved wing efficiency, engine efficiency and lower aircraft weight, the A310 is 21 percent more fuel efficient than its predecessor. Airbus claims that the A310 will carry more passengers and cargo at lower costs than the Boeing 767, but sales figures to date show 311 767's ordered vs 183 A310's ordered. Flight testing, begun in April 1982, is expected to lead to certification in Europe in March 1983. A.B.

A82-42791 # **Passive aircraft location.** J. L. Leva (Mitre Corp., Bedford, MA). *Astronautics and Aeronautics*, vol. 20, Sept. 1982, p. 52, 53.

Results of a study of systems equations and fabrication of a test passive ground-based aircraft detection system are presented. Discrimination abilities of the system are noted to include accuracy in a noisy environment, sorting out aircraft emissions, and time-difference-of-arrival signal processing. A civilian Mark X signal transponder was employed as the test emitter, while sensors were spread on the ground with a 10-25 n mi separation. Measurements were made of pulse time of arrival, amplitude, and frequency, and fed to the sorting algorithms. Synchronization was established between the sensors using rubidium frequency standards. It was shown that the passive system could measure the signal time of arrival, frequency, and the direction of arrival, even if the aircraft were approaching in a line. M.S.K.

A82-42792 * # **Bonding procedure for Teflon seals.** S. R. Barringer, T. E. Ezell, Jr., A. B. Stacey, Jr., and D. B. Wright, Jr. (NASA, Langley Research Center, Hampton, VA). *Astronautics and Aeronautics*, vol. 20, Sept. 1982, p. 53.

Material and bonding procedures designed for use as seals at the National Transonic Facility at the NASA Langley Research Center are presented. Teflon TFE was chosen for its ability to withstand pressures of up to 130 psi and temperatures ranging from -320 to 150 F, in addition to tolerances of 0.074 in. and having a movement allowance of 0.75 in. during transient cycles. Since some of the seals are 14 in. in diameter, Teflon sheets had to be sliced and bonded together after machining to size, resulting in seals with circular, oval, straight, and rectangular cross sections. Step-by-step preparation procedures are provided, and it is noted that the scarf joints performed as predicted during tests. M.S.K.

A82-42808 # **An experimental examination of compressor blade flutter (Etude expérimentale du flottement d'aubes de compresseurs).** E. Szechenyi (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Société Française des Mécaniciens, Réunion sur Alimentation des Turbomachines - Difficultés et Remèdes, Paris, France, May 4, 5, 1982.)* ONERA, *TP* no. 1982-31, 1982. 11 p. In French.

Experimental methods and results of ONERA trials to determine ways to eliminate feed-induced flutter of axial compressor blades are described. A general equation for the flutter induced on a blade is defined, showing that two cases of instability exist; conditions when the aeroelastic force cancels the stiffness of the blades, and when the total damping is negative and amplitude of vibration increases to the rupture point. Operation of a wind tunnel with rectilinear blades at vibration frequencies between 0-500 Hz are reviewed, noting that flows between Mach 0.5 to Mach 1.0 have been examined. Hydraulic actuators initiate the vibratory movement of the pressurized air flow, and pressure measurements recorded the magnitude and characteristics of the turbulence. It has been demonstrated that in sub- and transonic regimes the angle of attack and stable vibration frequencies are dominant factors governing the onset of vibration. When no instabilities are present, conditions of an unstable feed flow are noted to be responsible for the appearance of flutter. M.S.K.

A82-42809 # **Aeroelastic equilibrium of a helicopter rotor in the presence of nonlinear aerodynamic forces (Equilibre aéroélastique d'un rotor d'hélicoptère en presence de forces aérodynamiques non linéaires).** J.-J. Costes (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Meeting on Prediction of Aerodynamic Loads on Rotorcraft, London, England, May 17-19, 1982.)* ONERA, *TP*, no. 1982-33, 1982. 22 p. 13 refs. In French.

A computer code for the aeroelastic coupling of a helicopter rotor, taking into account stall conditions around the retreating blade, is presented. Quasi-linear forms are developed for nonlinear lift functions, and the aerodynamics are based on the acceleration potential in a compressible fluid. Consideration is given to all quantitatively delineates: the vast differences in electromagnetic behavior exhibited by the principle composite materials (Graphite/epoxy & Kelvar), how to predict these different properties based on the materials intrinsic electrical properties (conductivity, permeability and permittivity) and how the airframe shape influences electromagnetic coupling. The electromagnetic threats of lightning electromagnetic pulse (LEMP), nuclear Electromagnetic pulse (NEMP). Author (GRA)

N82-30356# Northeastern Univ., Boston, Mass. Electronics Research Lab.
CONTROL ELECTRONICS FOR AIR-BORNE QUADRUPOLE ION MASS SPECTROMETER Final Report, 15 Sep. 1978 - 14 Sep. 1981
J. Spencer Rochefort and Raimundas Sukys Oct. 1981 310 p refs
(Contract F19628-78-C-0218; AF Proj. 2310)
(AD-A115399; AFGL-TR-82-0056) Avail: NTIS HC A14/MF A01 CSCL 07/4

The work concerned in this report spans the three-year period commencing 15 September 1978 and deals with the development of electronic instrumentation for rocket and balloon-borne quadrupole ion mass spectrometers. Electronic packages containing circuits to control the quadrupole filters and data processing were developed for sounding rockets launched from Red Lake, Ontario, Canada during the 26 February 1979 Solar Eclipse; from the Poker Flat Research Range, Chatanika, Alaska during 1980 and 1981 Solar Proton Event Programs and also the 1981 Auroral E Program. A microprocessor-based control system was developed for a balloon-borne mass spectrometer. This latter system also provides a two-way communications link for ground control of the experiment and data transmission during the flight. Author (GRA)

N82-30378# Naval Air Development Center, Warminster, Pa. Aircraft and Crew Systems Technology Directorate.
TITANIUM SURFACE TREATMENTS FOR ADHESIVE BONDING Phase Report
S. R. Brown and G. J. Pilla 31 Mar. 1982 50 p refs
(WF61542001)
(AD-A114710; NADC-82032-60) Avail: NTIS HC A03/MF A01 CSCL 13/8

The aircraft industry prepares titanium surfaces for adhesive bonding using various types of abrasive, etchant, chemical, and anodize treatments. A study was made to determine pretreatment effects on adhesive bond durability of titanium under severe environmental conditions of temperature, humidity, and stress. Replicate sets of Ti-6Al-4V titanium specimens were provided to aircraft manufacturers who prepared the sets using eleven different pretreatment processes. The manufacturers also bonded the specimens with the same four adhesive systems. Wedge specimens, bounded from 0.150-inch thick Ti-6Al-4V titanium were tested in a 140 F, 100% relative humidity atmosphere for a period of eight weeks. Chromic acid anodize, alkaline etch, chromate-fluoride and alkaline peroxide treatments resulted in substantially lower crack growth rates than phosphate-fluoride treatments. There was a slight difference in performance ranking of bonding pretreatments depending upon the adhesive system used. Author (GRA)

N82-30386# Pratt and Whitney Aircraft Group, West Palm Beach, Fla. Government Products Div.
IMPROVED PENETRANT PROCESS EVALUATION CRITERIA Final Report, 1 Aug. 1980 - 31 Jul. 1981
J. S. Cargill and K. D. Smith Wright-Patterson AFB, Ohio AFWAL Oct. 1981 51 p refs
(Contract F33615-80-C-5060; AF Proj. 2418)
(AD-A115157; PWA-FR-15223) Avail: NTIS HC A04/MF A01 CSCL 11/6

The objective of this program is to investigate the significance of the improvements and modifications suggested in 'Methods improvement of the Fluorescent Penetrant Inspection (FPI) Process.' The program is composed of three technical phases: (1) specimen preparation and baseline demonstration, (2) improved methods demonstration, and (3) statistical comparison of Phase I and Phase II. Author (GRA)

N82-30400*# Hughes Aircraft Co., Culver City, Calif.
STUDIES OF NEW PERFLUOROETHER ELASTOMERIC SEALANTS Final Contractor Report, 1 Oct. 1980 - 26 Sep. 1981
D. I. Basiulis and D. P. Salisbury Sep. 1981 105 p refs
(Contract NAS2-10334)
(NASA-CR-166377; NAS 1.26:166377; Rept-76-966; FR-81)
Avail: NTIS HC A06/MF A01 CSCL 11A

Channel and filleting sealants were developed successfully from cyano and diamidoxime terminated perfluoro alkylene ether prepolymers. The prepolymers were polymerized, formulated and tested. The polymers and/or formulations therefrom were evaluated as to their physical, mechanical and chemical properties (i.e., specific gravity, hardness, nonvolatile content, corrosion resistance, stress corrosion, pressure rupture resistance, low temperature flexibility, gap sealing efficiency, tensile strength and elongation, dynamic mechanical behavior, compression set, fuel resistance, thermal properties and processability). Other applications of the formulated polymers and incorporation of the basic prepolymers into other polymeric systems were investigated. A cyano terminated perfluoro alkylene oxide triazine was formulated and partially evaluated. The channel sealant in its present formulation has excellent pressure rupture resistance and surpasses present MIL specifications before and after fuel and heat aging. S.L.

N82-30404# Naval Research Lab., Washington, D. C.
LIFE ENHANCEMENT OF NAVAL SYSTEMS THROUGH ADVANCED MATERIALS
A. I. Schindler and I. Wolock 12 May 1982 50 p refs
(AD-A114722; NRL-4807) Avail: NTIS HC A03/MF A01 CSCL 11/3

Recent progress in the development of advanced materials to extend the life of Naval systems is discussed. The developments include anti-corrosion and anti-fouling paints, improved lubricants, and more durable helicopter rotor blades, as well as a variety of materials processing techniques and improved uses of materials to reduce corrosion, wear and fatigue of systems components. Author (GRA)

N82-30414# Suntech, Inc., Marcus Hook, Pa.
THE PREPARATION AND CHARACTERIZATION OF MIXTURES OF POLYCYCLOPENTADIENES AS SOLID RAMJET FUELS Final Report, 17 Jun. 1980 - 30 Jun. 1981
A. Schneider, L. W. Hall, Jr., and E. J. Janoski 15 Apr. 1982 18 p refs
(Contract N00019-80-C-0277)
(AD-A115075) Avail: NTIS HC A02/MF A01 CSCL 07/3

Conditions for the thermal polymerization of cyclopentadiene to tetracyclopentadienes and higher molecular weight oligomers are given for both neat and solution polymerization modes. Density and volumetric heats of combustion are given for the mixtures of oligomers formed under different conditions. Compatibilities of oligomers with hydroxyl terminated polybutadiene (HTPB) are given. Author (GRA)

N82-30432*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
THE INTERACTION OF RADIO FREQUENCY ELECTROMAGNETIC FIELDS WITH ATMOSPHERIC WATER DROPLETS AND APPLICATIONS TO AIRCRAFT ICE PREVENTION Thesis
Robert John Hansman, Jr. Jun. 1982 193 p refs
(Grants NAG1-100; NGL-22-009-640)
(NASA-CR-169246; NAS 1.26:169246; FTL-R82-5) Avail: NTIS HC A09/MF A01 CSCL 20N

The feasibility of computerized simulation of the physics of advanced microwave anti-icing systems, which preheat impinging supercooled water droplets prior to impact, was investigated. Theoretical and experimental work performed to create a physically realistic simulation is described. The behavior of the absorption cross section for melting ice particles was measured by a resonant cavity technique and found to agree with theoretical predictions. Values of the dielectric parameters of supercooled water were measured by a similar technique at lambda = 2.82 cm down to -17 C. The hydrodynamic behavior of accelerated water droplets was studied photograhically in a wind tunnel. Droplets were found to initially deform as oblate spheroids and to eventually become unstable and break up in Bessel function modes for large values of acceleration or droplet size. This confirms the theory as to the maximum stable droplet size in the atmosphere. A computer code which predicts droplet trajectories in an arbitrary flow field was written and confirmed experimentally. The results were consolidated into a simulation to study the heating by electromagnetic fields of droplets impinging onto an object such as an airfoil. It was determined that there is sufficient time to heat droplets prior to impact for typical parameter values. Design curves for such a system are presented. J.D.

N82-30437# Analysis and Technology, Inc., North Stonington, Conn.

UTILIZATION OF AN/APS-94 SIDE-LOOKING AIRBORNE RADAR SYSTEMS IN SEARCH AND RESCUE Interim Report, Jan. 1978 - Apr. 1982

S. R. Osmer, L. Nash, G. L. Hover, and T. J. Mazour Apr. 1982 23 p refs
(Contract DTCG39-81-C-80287)
(AD-A114484; USCG-D-14-82; CGR/DC-3/82) Avail: NTIS HC A02/MF A01 CSCL 17/9

Since September 1978, side-looking airborne radar (SLAR) detection data have been gathered in conjunction with visual detection experiments conducted by the U.S.C.G. R&D Center. These are part of a series of experiments designed to improve search planning guidance contained in the National Search and Rescue Manual. HC-130 aircraft, equipped with either the Airborne Oil Surveillance system (AOSS) or SLAR/radar image processor (SLAR/RIP) configuration of the AN/APS-94C or D SLAR, conducted controlled searches for life rafts, small boats, and 41-to 95-foot Coast Guard vessels. Through the use of a microwave tracking system and SLAR data, the positions of searchers and targets were accurately reconstructed to facilitate the verification of detections on SLAR films or video tape. These data were used to evaluate the effects of environmental and controllable parameters on SLAR detection of the various target types. Of the 12 parameters investigated, target size/composition, search altitude, swell height, wind speed, and humidity/precipitation were found to have a significant influence on SLAR detection performance. Sweep widths for SLAR search and recommendations for SLAR utilization in SAR missions are included. In addition, recommendations for future SLAR evaluation are made. Author (GRA)

N82-30462# Ohio State Univ., Columbus. ElectroScience Lab.

NEAR FIELD ANALYSIS OF AIRBORNE ANTENNAS Final Report

W. D. Burnside and N. Wang Dec. 1981 33 p refs
(Contract N00019-80-C-0593)
(AD-A115074; ESL-713321-4) Avail: NTIS HC A03/MF A01 CSCL 09/5

The radiation pattern analysis of the prolate spheroid based on the efficient UTD and geodesic solutions developed at least partially under previous NASC contracts has been combined with the flat plate scattering analysis in order to simulate complex airborne structures. This includes the junction edge scattering which results at the union between the fuselage (prolate spheroid) and flat plate. This solution is being verified by comparisons with various airborne antenna configurations. In addition, the geodesics for an ellipsoid have been found using a perturbation theory similar to that used for the prolate spheroid. This new ellipsoid configuration will be used to represent the fuselage in future simulation analyses. Author (GRA)

N82-30463# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. Dept. of Electrical Engineering.

THE EFFECT OF RADOME SCATTERING ON ECM ANTENNA PATTERNS M.S. Thesis

Robert K. Schneider Dec. 1981 150 p refs
(AD-A115517; AFIT/GE/EE/81D-52) Avail: NTIS HC A07/MF A01 CSCL 17/9

The problem of scattering by thin cylindrical dielectric shells of large circular cross sections is approached by two methods: (1) an infinite series of eigenfunctions, and (2) the method of moments. Numerical results are presented for shell radii of 0.3 lambda, 3.0 lambda, and 30 lambda, the source being an electric line current near but external to the shell. Computer programs are presented which implement these two solutions. When the scattering structure does become large limitations on numerical results are encountered due to computer memory and speed limitations. Author (GRA)

N82-30525*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DATA ACQUISITION SYSTEM FOR NASA LARC IMPACT DYNAMICS RESEARCH FACILITY

Royce F. McCormick, Jack C. Spears, James W. Lynch, and Frank R. Batten Jun. 1982 13 p
(NASA-TM-84510) Avail: NTIS HC A02/MF A01 CSCL 14B

A data system is designed to permit the simultaneous recording of 90 data channels on one 28 track magnetic tape recorder using a constant bandwidth FM multiplexing technique. Dynamic signals from transducers located in the test aircraft are amplified and fed to voltage controlled oscillators where they are converted to discrete FM signals. The signals from each group of five VCO's are fed to a mixer/distribution amplifier where they are combined into one composite signal and recorded, using direct recording techniques, on one magnetic tape recorder track. Millivolt signals from the recorders reproduce heads are amplified to one volt and then electronically switched to an FM demultiplexing system where appropriate frequency discrimination and signal filtering recover the original analog information. S.L.

N82-30547# Naval Postgraduate School, Monterey, Calif.

FLOW CONTROL FOR A HIGH ENERGY LASER TURRET USING TRAPPED VORTICES M.S. Thesis

James Edward Burd Dec. 1981 101 p refs
(AD-A115263; NPS67-81-017) Avail: NTIS HC A06/MF A01 CSCL 20/5

The Department of Defense is concerned with the viability of an airborne high energy laser system. The laser is housed in a blunt turret atop a NKC-135 aircraft. Turbulence generated by flow separation around the turret causes optical distortion of the laser beam. Control of flow separation is needed to improve laser beam performance especially for aft-aimed turrets. One technique proposed for flow control is a fairing design which will stabilize shed vortices by suction. A two dimensional computer model was used to design a fairing compatible with present test equipment. Experimental research of this fairing design was conducted in wind tunnel tests. Although flow mapping demonstrated improved flow performance through the use of suction, total quiescent flow was never achieved. A more adequate three dimensional model is needed to design a fairing that will stabilize trapped vortices. GRA

N82-30556# Garrett Turbine Engine Co., Phoenix, Ariz.

GAS FOIL BEARING DEVELOPMENT PROGRAM Final Report, 1 Jul. 1979 - 28 Feb. 1981

Francis J. Suriano Wright-Patterson AFB, Ohio AFWAL Sep. 1981 135 p
(Contract F33615-79-C-2037; AF Proj. 3048)
(AD-A114692; Rept-31-4089; AFWAL-TR-81-2095) Avail: NTIS HC A07/MF A01 CSCL 13/9

This document presents the final technical report for the nineteen-month gas foil bearing development program. The 3.5-inch foil bearing design was analyzed using an elasto-hydrodynamic analysis program. Bearing configurations with 10 and 8 foils were identified as having the potential to exceed the performance of the 12-foil GTCP165 APU bearing. A total of six bearing configurations were tested, two ambient temperature configurations using Teflon-S coated foils with a chrome-plated journal, and four with high-temperature foil and journal coatings. The high-temperature bearings used foil coatings Kaman DES, Kaman DES + au, Co-20 Ni, and TiC, all of which were run with a Kaman SCA-coated journal. Program goals were met with both ambient-temperature bearing configurations and Kaman SCA versus Kaman DES and TiC high-temperature configurations. GRA

N82-30566*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STRUCTURES AND DYNAMICS DIVISION RESEARCH AND TECHNOLOGY PLANS, FY 1982

Kay S. Bales Jun. 1982 56 p
(NASA-TM-84509; NAS 1.15:84509) Avail: NTIS HC A04/MF A01 CSCL 20K

Computational devices to improve efficiency for structural calculations are assessed. The potential of large arrays of microprocessors operating in parallel for finite element analysis is defined, and the impact of specialized computer hardware on static, dynamic, thermal analysis in the optimization of structural analysis and design calculations is determined. General aviation aircraft crashworthiness and occupant survivability is also considered. Mechanics technology required for design coefficient, fault tolerant advanced composite aircraft components subject choice of analytical methods. The components available are rigid blade rotor, elastic fuselage, rotor control system, and other structures representable by general linear second-order differential equations. The force methods available are linear rotor loads, tabular rotor aerodynamics with optional induced velocity map, fuselage flat plate drag, and sinusoidal shaker. The solution methods available are time history, linear constant coefficient eigenanalysis, and complex frequency response. The program has the capability of being expanded in its level of complexity by the addition of other technology modules. Author (GRA)

N82-32080*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THE NOISE IMPACT OF PROPOSED RUNWAY ALTERNATIVES AT CRAIG AIRPORT

Richard DeLoach Jun. 1982 36 p refs
(NASA-TM-84503; NAS 1.15:84503) Avail: NTIS HC A03/MF A01 CSCL 20A

Four proposed runway expansion alternatives at Craig Airport in Jacksonville, Florida have been assessed with respect to their forecasted noise impact in the year 2005. The assessment accounts for population distributions around the airport and human subjective response to noise, as well as the distribution of noise levels in the surrounding community (footprints). The impact analysis was performed using the Airport-noise Levels and Annoyance Model (ALAMO), an airport community response model recently developed at Langley Research Center. Author

N82-32081*# California Univ., Los Angeles.

AEROSOUND FROM CORNER FLOW AND FLAP FLOW

W. C. Meecham Jul. 1982 41 p refs Prepared in cooperation with Mechanics Development Co., Pacific Palisades, Calif.
(Contract NAS2-10590)
(NASA-CR-166396; NAS 1.26:166396) Avail: NTIS HC A03/MF A01 CSCL 20A

Noise generation at the edge of a wing flap is analyzed. The phenomenon as a single vortex moving around a corner in an incompressible, potential flow is modelled. Vortex image retarding effects are proposed as an explanation for small Strouhal numbers. The model surface pressures, sound pressures (using Curle's theory), and Mach number dependencies agree with wind tunnel experiments. A double pressure peak is found in the model (credited to image action) which is qualitatively similar to measured sound correlations. Incompressible flow aerosound calculations are discussed. The effects of a series of vortices moving in the same idealized potential flow are also studied. The vortices are assumed to be statistically independent so their intensities can be added. The frequency of appearance of the vortices are determined from measurements. Diffraction effects caused by the presence of the wing near the dipole sound radiators on the flap surfaces are included. S.L.

N82-32082*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ROUGH ANALYSIS OF INSTALLATION EFFECTS ON TURBOPROP NOISE

Paul A. Durbin and John F. Groeneweg 1982 17 p refs Proposed for Presentation at the Acoust. Soc. of Am., Orlando, Fla., 8-12 Nov. 1982
(NASA-TM-82924; E-1316; NAS 1.15:82924) Avail: NTIS HC A02/MF A01 CSCL 20A

A rough analysis of noise from a propeller operated at angle of attack, and in the nonuniform flow due to a line vortex approximating a wing flow field suggests installation can significantly affect turboprop noise levels. On one side of the propeller, where the blades approach the horizontal plane from above, decreases of noise occur; while on the other side noise increases. The noise reduction is due to negative interference of steady and unsteady sources. An angle of attack, or distance between propeller and vortex, exists for which noise is a minimum. Author

N82-32083# Federal Aviation Administration, Washington, D.C. Office of Environment and Energy.

HELICOPTER NOISE DEFINITION REPORT UH-60A, S-76, A-109, 206-L Final Report

J. Steven Newman, Edward J. Rickley (DOT, Cambridge, Mass.), and David W. Ford Dec. 1981 687 p
(AD-A116363; DOT/FAA/EE-81/16) Avail: NTIS HC A99/MF A01 CSCL 20/1

This document presents noise data for the Sikorsky UH-60A Blackhawk, the Sikorsky S-76 Spirit, the Agusta A-109 and the Bell 206-L. The acoustical data are accompanied by phototheodolite tracking data, cockpit instrument panel photo data, and meteorological data acquired from radiosonde balloons. Acoustical metrics include both noise certification metrics (EPNL, PNLT, PNL) as well as community/airport noise assessment metrics (SEL, dBA). Noise data have been acquired systematically to identify variations in level with variations in helicopter airspeed and altitude. Data contained in this report provide essential information for development of helicopter noise exposure contours as well as further evaluation of ICAO helicopter noise certification standards. Accordingly, this information will be of interest to helicopter manufacturers, airport planning consultants, acoustical engineers and airport managers. This report serves as a noise definition document establishing baseline acoustical characteristics of the test helicopters. Author (GRA)

N82-32084# Federal Aviation Administration, Washington, D.C. Office of Environment and Energy.

A DESCRIPTION OF METHODOLOGIES USED IN ESTIMATION OF A A-WEIGHTED SOUND LEVELS FOR FAA ADVISORY CIRCULAR AC-36-3B

Jan. 1982 114 p refs
(AD-A116543; FAA-EE-82-1; DOT/FAA/AEE-82-1) Avail: NTIS HC A06/MF A01 CSCL 20/1

This report provides a description of the assumptions, methodologies and techniques employed in arriving at estimated sound levels for many of the aircraft included in FAA Advisory Circular AC-36-3B. AC 36-3B was published to provide the public and the aviation community with comparative sound level information for aircraft currently in use. Detailed noise estimation data sheets are provided for 78 aircraft types. A table showing the difference between EPNL and dB(A) for selected jet aircraft is also provided. Author (GRA)

N82-32140# Federal Aviation Administration, Atlantic City, N.J. Technical Center.

FIBER OPTICS REMOTING OF TERMINAL RADAR AND BEACON SIGNALS Final Report, Jul. 1980 - May 1981

Robert G. Oliver May 1982 68 p refs
(FAA Proj. 021-241-860)
(AD-A116403; FAA-CT-81-71; FAA-RD-82-20) Avail: NTIS HC A04/MF A01 CSCL 17/9

This report discusses the study phase of the terminal radar-beacon fiber optics remoting project. Fiber optics technology is discussed and applied to the remoting of airport sureveillance radar (ASR) and air traffic control beacon interrogator (ATCBI) video and control signals. The requirements of this system are outlined and an engineering model, using multiplexed and nonmultiplexed video transmissions, is specified for installation at the Federal Aviation Administration (FAA) Technical Center. Tests to be conducted on this system are briefly outlined. Cost estimates are presented as well as suggested sources of supply fort the fiber optic components. The interface to the ASR and ATCBI systems is described. It is recommended that the system be built by the technical center. A schedule for completion of the remainder of the project is presented. Author (GRA)

N82-32186*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THERMODYNAMIC AND TRANSPORT COMBUSTION PROPERTIES OF HYDROCARBONS WITH AIR. PART 1: PROPERTIES IN SI UNITS

Sanford Gordon Jul. 1982 397 p refs
(NASA-TP-1906; E-946; NAS 1.60:1906) Avail: NTIS HC A17/MF A01 CSCL 20M

Thermodynamic and transport combustion properties were calculated for a wide range of conditions for the reaction of hydrocarbons with air. Three hydrogen-carbon atom ratios (H/C = 1.7, 2.0, 2.1) were selected to represent the range of aircraft fuels. For each of these H/C ratios, combustion properties were calculated for the following conditions: Equivalence ratio: 0, 0.25, 0.5, 0.75, 1.0, 1.25 Water - dry air mass ratio: 0, 0.03 Pressure, kPa: 1.01325, 10.1325, 101.325, 1013.25, 5066.25 (or in atm: 0.01, 0.1, 1, 10, 50) Temperature, K: every 10 degrees from 200 to 900 K; every 50 degrees from 900 to 3000 K Temperature, R: every 20 degrees from 360 to 1600 R; very 100 degrees from 1600 to 5400 R. The properties presented are composition, density, molecular weight, enthalphy, entropy, specific heat at constant pressure, volume derivatives, isentropic exponent, velocity of sound, viscosity, thermal conductivity, and Prandtl number. Property tables are based on composites that were calculated by assuming both: (1) chemical equilibrium (for both homogeneous and heterogeneous phases) and (2) constant compositions for all temperatures. Properties in SI units are presented in this report for the Kelvin temperature schedules. Author

N82-32187*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMODYNAMIC AND TRANSPORT COMBUSTION PROPERTIES OF HYDROCARBONS WITH AIR. PART 2: COMPOSITIONS CORRESPONDING TO KELVIN TEMPERATURE SCHEDULES IN PART 1
Sanford Gordon Jul. 1982 281 p refs
(NASA-TP-1907; E-947; NAS 1.60:1907) Avail: NTIS HC A13/MF A01 CSCL 20M

The equilibrium compositions that correspond to the thermodynamic and transport combustion properties for a wide range of conditions for the reaction of hydrocarbons with air are presented. Initially 55 gaseous species and 3 coin condensed species were considered in the calculations. Only 17 of these 55 gaseous species had equilibrium mole fractions greater than 0.000005 for any of the conditions studied and therefore these were the only ones retained in the final tables. J.M.S.

N82-32188*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMODYNAMIC AND TRANSPORT COMBUSTION PROPERTIES OF HYDROCARBONS WITH AIR. PART 3: PROPERTIES IN US CUSTOMARY UNITS
Sanford Gordon Jul. 1982 362 p refs
(NASA-TP-1908; E-948; NAS 1.60:1908) Avail: NTIS HC A16/MF A01 CSCL 20M

Thermodynamic and transport properties are presented for a wide range of conditions for the reaction of hydrocarbons with air. The values given are in U.S. customary units. J.M.S.

N82-32189*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMODYNAMIC AND TRANSPORT COMBUSTION PROPERTIES OF HYDROCARBONS WITH AIR. PART 4: COMPOSITIONS CORRESPONDING TO RANKINE TEMPERATURE SCHEDULES IN PART 3
Sanford Gordon Jul. 1982 281 p refs
(NASA-TP-1909; E-949; NAS 1.60:1909) Avail: NTIS HC A18/MF A01 CSCL 20M

The equilibrium compositions corresponding to the thermodynamic and transport combustion properties for a wide range of conditions for the reaction of hydrocarbons with air are presented. The compositions presented correspond to Rankine temperature schedules. J.M.S.

N82-32300# Joint Publications Research Service, Arlington, Va.
AIRBUS A 310 WILL COMPETE WITH BOEING 767 FOR MARKET
Pierre Kerlouegan *In its* West Europe Rept.: Sci. and Technol., No. 99 (JPRS-80536) 9 Apr. 1982 44-47 Transl. into ENGLISH from Le Figaro (France), 17 Feb. 1982 p 9
Avail: NTIS HC A04

The European A-310 airbus is described, compared with the Boeing 767, and an analysis of its market presented. The A-310 is certified to fly with a crew of two. Projections for the larger A-320 are given. The basic configuration of the A-310 is presented. J.D.

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wakes and the blades are modeled in terms of a lifting line 1/4 from the front of the blade. Modifications of the linear theory of aeroelastic coupling is guided by two-dimensional results on stalled profiles. The complete nonlinear system is transformed by means of the introduction of quasi-steady constraints in order to estimate power increases necessary to overcome losses due to flow separation. M.S.K.

A82-42810 # Corrections for wall effects in ONERA industrial wind tunnels (Améliorations des calculs des effets de parois dans les souffleries industrielles de l'ONERA). X. Vaucheret (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Meeting on Prediction of Aerodynamic Loads on Rotorcraft, London, England, May 17-19, 1982.) ONERA, TP* no. 1982-34, 1982. 13 p. 11 refs. In French.

Analytical methods for allowing for the effects of the walls on flows in transonic wind tunnels operated by ONERA are presented. The discussion is limited to the case of three-dimensional models in cylindrical wind channels. Attention is given to the numerical description of the model and the sting mount, to the use of a method of characteristics for the verification of the numerical models of the model-sting configurations and the models of wall porosity, and to correction coefficients for particular wind tunnel channels. A volumetric representation of ellipsoidal fuselages is discussed, including using a number of doublets equal to twice the thickness of the fuselage. Further consideration is given to the calculation of lift, wall porosity, nonzero lift characteristics, and corrections of the Mach number. M.S.K.

A82-42811 # An examination of helicopter blade profiles and tips (Etudes de profils et d'extrémités de pale d'hélicoptère). J. J. Thibert and J. J. Philippe (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Meeting on Prediction of Aerodynamic Loads on Rotorcraft, London, England, May 17-19, 1982.) ONERA, TP* no. 1982-35, 1982. 15 p. 28 refs. In French.

The results of long-term ONERA research into profiles and tips of composite material helicopter blades are summarized. Consideration is given to the use of symmetric NACA profiles on older helicopter designs and to the development of new profiles with numerically modeled internal and external sections. Trials with the OA2XX profile blades on scale model helicopters in the Modane wind tunnel have shown a nominal power augmentation of 9 percent. Flight tests with OA209 blades have, in comparison with the NACA 0012 blades, displayed isopower increases of 2 percent, an enlarged flight envelope such as 10 percent maximum speed or power increases, and more economic rotor performance at high speeds. Two dimensional modeling of the interior of the rotor has been shown to give way to three-dimensional modeling near the tip in order to maintain accuracy. Iso-Mach lines have been calculated from azimuths of 60 and 120 deg and with bending of 30 deg. Further studies to evaluate parabolically flexed tip configurations are indicated. M.S.K.

A82-42813 # The use of adaptive walls in plane flows (Utilisation de parois adaptables pour les essais en courant plan). J. P. Archambaud (ONERA, Centre d'Etudes et de Recherches de Toulouse, Toulouse, France) and J. P. Chevallier (ONERA, Division d'Aérodynamique Expérimentale, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(NATO, AGARD, Meeting on Wall Interference in Wind Tunnels, London, England, May 19, 20, 1982.) ONERA, TP* no. 1982-38, 1982. 15 p. 38 refs. In French.

Computational methods which take into account the effects induced in plane flows by the presence of adaptive walls in a wind tunnel are presented, along with test results from the ONERA T2 transonic wind tunnel. Modeling of the wall effects through the method of signatures is analytically described, with consideration given to the length of the adapted regions, fairings with up- and down-stream regions, residual effects, and reference conditions. Operation of the walls to induce varying flow conditions is outlined, and iterative procedures for quantifying the flow under the initial, changing, and new conditions are presented. The numerical techniques are shown to include factors such as the diminution of the flow in proportion to the distance from the adaptive wall sections, movement of the walls in 2 mm steps to examine camber, and fast convergence of the solution of adaptation to acceleration represented by a single gust. M.S.K.

A82-42817 # Boundary layer transducers /DCL/ developed for the study of the flow over helicopter rotor blades. C. Armand, P. Combet, and J.-P. Drevet (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Institute of Electrical and Electronics Engineers, Congress on Instrumentation in Aerospace Simulation Facilities, 9th, University of Dayton, Dayton, OH, Sept. 20-Oct. 2, 1981.) ONERA, TP* no. 1981-93, 1981. 9 p. 5 refs.

The development of thermistors as a suitable replacement for hot-film transducers for boundary layer experiments in the ONERA Modane test center is described, and comparisons are made between performances of the thermistor and hot-film devices. The operation of both apparatus is described in terms of the power fluctuations necessary to maintain a constant temperature in an electrically heated element subject to ambient fluctuating flow. Operating parameters for boundary layer transducers are defined. Fabrication of a 0.2 sq mm, 10 microns thick, 200 ohms resistance (low temperature) and 250 ohms (high temperature), 11 mA heating element semiconductor thermistor for boundary layer studies is noted, including characteristics which form a Wheatstone bridge. The measurement voltage has been transmitted over 100 m without loss, and frequencies of pressure fluctuations have been detected up to 15 kHz. Wind tunnel tests with both types of transducers implanted on rotary wings have revealed conditions which are not quantifiable using models for fixed wing flowfields. M.S.K.

A82-42849 Taking the drag out of bombs. C. Epstein (NATO, Brussels, Belgium). *Flight International,* vol. 122, Aug. 21, 1982, p. 418-420.

Conformal carriage of weapons and stores offers significant advantages over external multiple ejector rack carriage, expanding the flight envelope of the F-4 (with twelve 500 pound bombs) from Mach 1.1 to 1.8, reducing overall drag 60% and extending mission radius nearly 50%. Conformal mounting of fuel tanks (fast packs) on the F-15C provides more than 230 n mi further low altitude dash, 100 n mi further radius at Mach 2, and from one and one-half to three hours extra on-station time at a 500 n mi radius. Radar cross-section and maneuverability are also improved. The General Dynamics F-16XL features semi-conformal weapons carriage, and comparable improvements of performance are expected. A.B.

A82-42865 # In-flight acoustic emission monitoring. I. G. Scott (Department of Defence, Aeronautical Research Laboratories, Melbourne, Australia). In: Symposium on Nondestructive Evaluation, 13th, San Antonio, TX, April 21-23, 1981, Proceedings. San Antonio, TX, Southwest Research Institute, 1982, p. 210-219. 8 refs.

The feasibility of the in-flight acoustic emission (AE) monitoring of fatigue cracks has been assessed by a flight test program employing a Royal Australian Air Force Macchi jet trainer aircraft. It is found that despite the hostile environment in which the equipment is operating, AE signals originating from a known spar fatigue crack have upon analysis yielded suggestive data on the relation between AE, flight regimes and crack growth parameters. Magnetic rubber replica inspection, EPROM flight data recording and flight profile data breakdowns have been employed in this research project. O.C.

A82-42887 # Laser pointing in a turbulent atmosphere. A. L. Pavel (USAF, Weapons Laboratory, Kirtland AFB, NM). In: Aero-optical phenomena. New York, American Institute of Aeronautics and Astronautics, 1982, p. 401-411. 10 refs.

The sources of jitter encountered in optical pointing from an airborne platform are surveyed. Aircraft always operate in some level of atmospheric turbulence and this turbulence induces motion which must be compensated for by an optical pointing system. Levels of atmospheric gust turbulence are related to the corresponding airframe jitter. This level of jitter will determine the capability required by the pointing system. Once the beam leaves the aircraft the final pointing accuracy becomes a function of atmospheric turbulence, which influences the index of refraction of the air through which the light must pass. Levels of atmospheric temperature turbulence are used to predict system jitter that could be expected. The combined effects of atmospheric gust and temperature turbulence constitute the budget of beam jitter that must be factored into laser pointing experiments. (Author)

A82-42893 † Antiwear properties of additives based on higher fatty acids (Protivoiznosnye svoistva prisadok na osnove vysshikh zhirnykh kislot). O. P. Lykov, T. P. Vishniakova, V. V. Sashevskii, and L. S. Zaitseva (Moskovskii Institut Neftekhimicheskoi i Gazovoi Promyshlennosti, Moscow, USSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 8, 1982, p. 16, 17. 5 refs. In Russian.

The antiwear characteristics of additives based on higher fatty acids isolated from C17-C20 fractions and residues of synthetic fatty acids production have been investigated experimentally using the additives with hydrofined jet fuel T-7. Of the additives investigated, isomonocarboxylic and unsaturated acids of C17-C20 fractions are found to have the highest antiwear characteristics when used in amounts of 0.002-0.007 mass %. V.L.

A82-42894 † Determination of antioxidant content in aviation oils using thin-layer chromatography (Opredelenie soderzhaniia antiokislitel'nykh prisadok v aviatsionnykh maslakh metodom TSKh). P. A. Mikheichev, A. V. Vilenkin, and I. M. Novikova (GOSNIIErat GA, USSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 8, 1982, p. 35-37. 6 refs. In Russian.

A method based on thin-layer gas chromatography is proposed for determining the amounts of antioxidants in fresh and used aviation oils. The accuracy of the method has been verified by determining the content (which was known to be 0.35% by mass) of dibutyl-n-cresol additive in oil. Analysis of the measurements has shown that the method is accurate to within 6.0%, which is sufficient for oil quality control purposes. V.L.

A82-42895 † Antioxidants for synthetic oils (Antiokislitel'nye prisadki k sinteticheskim maslam). Kh. N. Kulieva and V. S. Smolenkova (Akademiia Nauk Azerbaidzhanskoi SSR, Baku, Azerbaidzhan SSR). *Khimiia i Tekhnologiia Topliv i Masel,* no. 8, 1982, p. 40-42. 21 refs. In Russian.

Recent advances in the synthesis of antioxidants for synthetic lubrication oils used in modern jet engines are briefly reviewed. In particular, consideration is given to nitrogen-containing antioxidants (e.g., succinimide-type compounds, aromatic amines, and Schiff's bases), metal-containing antioxidants (e.g., complex compounds of group I or group VIII metals), and mixtures of two or three different antioxidants characterized by a synergic effect. V.L.

A82-42950 * # **Transient phenomena of shock-induced turbulent separation for a spikebody and stalling airfoil at transonic and supersonic speeds.** K. K. Yoshikawa (NASA, Ames Research Center, Moffett Field, CA). *American Institute of Aeronautics and Astronautics, Atmospheric Flight Mechanics Conference, 9th, San Diego, CA, Aug. 9-11, 1982, Paper 82-1362.* 19 p. 17 refs.

The time-dependent, compressible, Reynolds-averaged, full Navier-Stokes equations are applied to solve an axisymmetric flow around a forward-facing stepbody (spikebody) at supersonic speeds and a stalling airfoil at transonic speeds. Important transient and unsteady phenomena, not yet well understood, are examined, and significant new findings of the present solution to the phenomena are discussed. The phenomena described in detail are as follows: The evolution of the shock wave pressure built up by the impact of the pressure waves, one from the trailing edge; the separation of the flow as influenced by the shock wave; the location of the reversed flow, the separation point, and the reattachment point; and the transient (or unsteady) phenomena of the flow pulsation, oscillation, and stalling of the body and airfoil wake flow. The numerical results show that the transient flow instability is caused by a supersonic jet induced in the separation bubble by the shock-bifurcation (lambda shock) mechanism between the separation shock and the reflected shock. Pulsation and stall phenomena are caused by a sudden increase in the leading-edge pressure due to the jet and the separation bubble interacting along the stagnation point flow. (Author)

A82-43091 **Apache to provide night/bad weather capability.** R. R. Ropelewski. *Aviation Week and Space Technology*, vol. 117, Sept. 13, 1982, p. 42, 43, 45 (4 ff.).

Test flights of the Hughes AH-64 Apache advanced attack helicopter, due for delivery to the Army in early 1984, displayed its capability for night and adverse weather antitank/operations. The aircraft's two 1,690 shp T700-GE-701 engines exceeded the Army's high/hot rate of climb requirements and provided a maximum 1,700-1,800 fpm rate of climb. Low altitude nap-of-the-earth flying is facilitated by the precision and quick response of the handling, as well as by the high instantaneous turn rate. Doppler navigation system, day/night vision systems, laser ranging/ designating/tracking and digital fire control computer are integrated to minimize the need for communications between the two cockpits, and to reduce the pilot workload. The AH-64 is armed with Hellfire missiles, and standard 2.75-inch rockets. A.B.

A82-43092 **New nozzle design aimed at F-15, F-16 aircraft.** *Aviation Week and Space Technology*, vol. 117, Sept. 13, 1982, p. 67, 71, 73.

The two-dimensional convergent/divergent nozzle consists of two convergent-/divergent flaps which vary thrust and exit area as well as control vectoring and reversing. Vectoring on the order of + or - 30 degrees is possible. Designed for short takeoff and landing, and for high Mach maneuvering, landing distances on dry runways are reduced from 3,000 to 1,000 feet, and from 10,000 to 1,200 feet on icy runways. The rectangular nozzle has lower cost and weight than circular nozzles with the same capacity. Ground demonstration tests produced a maximum 8,000 pound perpendicular thrust component and 6,200 pounds of reverse thrust. The nozzle could be employed in an F-15 or F-16, and several external contours for it are being considered. A.B.

A82-43111 # **Construction and testing of an Omega navigation system for the balloon-borne X-ray experiment (Aufbau und Test eines Omega-Navigationssystems für das Ballon-Röntgenexperiment).** E. Götz. Tübingen, Universität, Astronomisches Institut, Diplomarbeit, 1981. 109 p. 26 refs. In German.

Various systems are compared for their suitability for determining balloon position. The Omega navigation system is discussed, with emphasis on the propagation characteristics of VLF waves, which strongly influence the positional accuracy of the system. A concept for a Tübingen navigation system is presented that is suitable for position determination in the X-ray experiment. A software algorithm that permits the application of hyperbolic coordinates to geographic position is described along with a real-time program that would evaluate the data from the Omega receiver during balloon flight and convert them to geographical position using the algorithm. This calculation procedure is confirmed by a test and its attainable accuracy is found. The receiver electronics and its functional principle is discussed, as is the mode of data transfer to the computer. C.D.

A82-43184 **The external balance system of the German- Dutch windtunnel DNW and its strain gage load cells.** C. C. Groothoff (Nationaal Lucht- en Ruimtevaartlaboratorium, Emmeloord, Netherlands), D. Theiss, and P. Giesecke (Carl Schenck AG, Darmstadt, West Germany). In: Symposium on Force, Pressure, Displacement and Flow Sensors, Technische Hogeschool Twente, Enschede, Netherlands, May 13, 14, 1982, Proceedings. (A82-43176 21-35) Enschede, Netherlands, Technische Hogeschool Twente, 1981, p. 99-113.

The external six component balance system of the German-Dutch Windtunnel DNW is described. Although designed for a multitude of testing circumstances, the requirements on aircraft model testing were dominant. The applied aerodynamic loads (e.g. 65,000 N lift) and the dimensions of the models and wind tunnel size resulted in a large and heavy instrument. The balance is of the platform type, enabling a simple and stiff construction. The requirements regarding the allowable errors - order of magnitude 0.1% f.s for forces, 0.2% f.s for moments - posed high demands on the design of the balance and calibration equipment, but check loads showed that the requirements were met. (Author)

A82-43249 **Meteorological aspects of North Atlantic flight tracks - The development of programs for minimum-time tracks.** L. Bennett (Civil Aviation Authority, London, England). *Journal of Navigation*, vol. 35, Sept. 1982, p. 499-501.

The phase of a flight planning operation in which airline personnel calculate minimum time tracks for the purpose of advising oceanic control centers of their needs is described, before defining the Organised Track System. Results are based on 12- and 24-hour forecasts for a 250-mb level, and aircraft with a nominal constant speed of Mach 0.82. The graphical method customarily employed is that of finding the minimum time track, which involves drawing the envelopes of a large number of circles. This, however, is unsuitable for computer implementation. The problem may alternatively be defined in terms of a network, using an algorithm to obtain the shortest paths. O.C.

A82-43250 **Meteorological aspects of North Atlantic flight tracks - Some interim results of the study.** R. Monk (Civil Aviation Authority, London, England). *Journal of Navigation*, vol. 35, Sept. 1982, p. 502-513; Discussion p. 513-516.

A comparison is presented of minimum time North Atlantic flight tracks calculated for the weather conditions forecast and those analyzed after each of the flights between 12 city pairs. The differences show that the effect of forecast error is small, averaging 1.5 min of flying time for both 12- and 24-hour forecasts, and being 4 min or less in about 90% of the flights studied. The remaining 10% range from 4 min to a maximum of 21 min for a 24-hour forecast and 16 min for a 12-hour one. O.C.

A82-43261 * # **Statistical analysis of piloted simulation of real time trajectory optimization algorithms.** D. B. Price (NASA, Langley Research Center, Hampton, VA). *IEEE, AIAA, AIChE, ASME, ISA, and SME, American Control Conference, Arlington, VA, June 13-16, 1982, Paper.* 3 p.

A simulation of time-optimal intercept algorithms for on-board computation of control commands is described. The effects of three different display modes and two different computation modes on the pilots' ability to intercept a moving target in minimum time were tested. Both computation modes employed singular perturbation theory to help simplify the two-point boundary value problem associated with trajectory optimization. Target intercept time was affected by both the display and computation modes chosen, but the display mode chosen was the only significant influence on the miss distance. A.B.

A82-43264 * # **Current perspectives on emergency spin-recovery systems.** R. D. Whipple (NASA, Langley Research Center, Hampton, VA). *Society of Flight Test Engineers, Symposium on Flight Testing Technology - A State of the Art Review, New York, NY, Sept. 19-22, 1982, Paper.* 13 p. 23 refs.

The requirements generated by the loss-of-control problems of contemporary and future aircraft are discussed in connection with the development of rocket and parachute technology for spin-recovery systems used in current aircraft. Recovery rockets must be designed to provide the thrust (not impulse) levels required by the specific application, because insufficient thrust will not effect a recovery regardless of its duration. The need for long firing times and a restart capability make liquid rocket systems preferable. Alternatives to the current tail-mounted method of implementing parachute systems include: nose chutes, wing-tip parachutes, dual-bridle and rigid towline systems. Comparative test results for these and the conventional system are given along with the latest dynamic model test technique for spin-recovery rockets. A.B.

A82-43275 **757 systems key to route flexibility.** R. R. Ropelewski. *Aviation Week and Space Technology*, vol. 117, Aug. 30, 1982, p. 36-38, 43, 45, 46.

The Boeing 757 is a single-aisle narrow body commercial transport accommodating 186 passengers, with twin engines which each produce 37,000 pounds thrust, a maximum takeoff weight of 220,000 pounds, and a maximum range of 2,650 nautical miles. The operating procedures and cockpit layout of the 757 are almost identical to those of the 767, which will permit flight crews to obtain a common rating for both, and can reduce maintenance and support costs for airlines operating both aircraft. The avionics aboard include an integrated flight management computer, autopilot/flight director, thrust management system and color cathode ray tube displays. The maiden flight was on February 19, 1982, and to combined loads, impact, postbuckling effects and local discontinuities are developed. S.L.

N82-30606# Lockheed Engineering and Management Services Co., Inc., Houston, Tex. Office of Remote Sensing Technology Implementation.

PHOTOINTERPRETATION KEY FOR PINE REGENERATION ANALYSIS USING HIGH-ALTITUDE COLOR INFRARED PANORAMIC PHOTOGRAPHY Final Report

B. B. Eav, C. A. Clark, R. E. Kinkle, and J. C. Prill Aug. 1981 38 p refs
(Contract USDA/FS-53-3187-0-29)
(PB82-164450; LEMSCO-16379; NFAP-247) Avail: NTIS HC A03/MF A01 CSCL 02F

A photointerpretation key for analysis of pine regeneration was developed during the second of the three phases of a timber inventory project. The procedures used in developing the photointerpretation key are presented, and the resulting selective photointerpretation key with color illustrations (stereopairs) is presented. This photointerpretation key represents a model application of high-altitude color infrared panoramic photography to timber inventory and should pave the way for more imaginative applications of optical bar technoloy to resource inventories. GRA

N82-30608# Lockheed Engineering and Management Services Co., Inc., Houston, Tex. Office of Remote Sensing Technology Implementation.

HIGH-ALTITUDE IMAGERY USER GUIDE

Richard E. Hinkle Aug. 1981 127 p refs
(Contract USDA/FS-53-3187-0-29)
(PB82-158353; LEMSCO-16312; NFAP-224) Avail: NTIS HC A07/MF A01 CSCL 02F

New and more efficient remote sensing methods to users in the field are presented. The high altitude aircraft and associated sensor systems are discussed. Applications in use, such as resource inventories, pest management, catastrophic damage assessment, resource management and planning are outlined. GRA

N82-30782# Scripps Institution of Oceanography, La Jolla, Calif. Visibility Lab.

AIRBORNE MEASUREMENTS OF EUROPEAN SKY AND TERRAIN RADIANCES Scientific Interim Report

Richard W. Johnson Aug. 1981 36 p refs
(Contract F19628-78-C-0200; AF Proj. 6210)
(AD-A114637; SIO-82-2; AFGL-TR-81-0275; SIR-19) Avail: NTIS HC A03/MF A01 CSCL 04/1

A data set which contains nearly 500 arrays representing measurements of sky and terrain radiance values from 47 different flights is described and illustrated. The measurements were made using radiometer systems mounted on a C-130 aircraft during a series of European flights associated with the NATO program OPAQUE. Radiance measurements throughout the 4 pi field surrounding the aircraft were made in four spectral bands having mean wavelengths of 478, 557, 664, and 765 nm. Spectral sets of measurements were made at each of several altitudes between the surface and approximately 6 km AGL. Evaluation of the data illustrates good orientation and radiometric accuracies, except for stray light influences as the radiometer field of view swept near and through the solar disc. Corrective procedures are outlined and their application is undergoing further refinement. These data are appropriate for use in the development of operationally useful predictive models. The radiance data in conjunction with their companion scattering coefficient data, are readily applicable to the determination of slant path contrast transmittances, atmospheric optical depths, aerosol directional scattering characteristics, flux divergences and their attendant determinations of turbid atmospheric single scattering albedos. GRA

N82-30800# Ohio Univ., Athens. Avionics Engineering Center.

EVALUATION OF THE FAA/MITRE WEATHER DATA DEVICE Final Report

Delmar G. Pullins Washington FAA Jan. 1982 59 p refs
(Contract DTFA01-81-C-10007)
(AD-A114646; OU/AEC/EER-54-1; DOT-FAA-RD-82-14) Avail: NTIS HC A04/MF A01 CSCL 04/2

A cockpit weather display unit was evaluated. Twenty subject pilots were flown using prerecorded weather information, and real time weather information from the Columbus weather radar. The airborne system consists of a VOR Receiver, a processor unit, a control module, and a hardcopy printer that provides the pilot with ground weather radar information in the cockpit upon demand. It is found that providing the pilot with a low cost, real time radar weather information source, will be a distinct factor in reducing unnecessary radio transmissions, controller workload, and will aid the pilot in decision making. The installation of such a unit in the cockpit would eliminate errors due to verbal communication of the weather picture, provide useful information, and directly attack the major problem of aviation thunderstorm avoidance. E.A.K.

N82-30804# National Oceanic and Atmospheric Administration, Norman, Okla. National Severe Storms Lab.

FIELD PROGRAM OPERATIONS: TURBULENCE AND GUST FRONT Final Report, Mar. 1980 - Dec. 1980

J. T. Lee and R. J. Doviak Washington FAA Nov. 1981 43 p
(Contract DTFA01-80-Y-10524)
(AD-A115447; DOT-FAA-RD-81-108) Avail: NTIS HC A03/MF A01 CSCL 04/2

Aircraft, rawinsonde network, mesoscale surface network, low-level wind shear alert system at Will Rogers World Airport, 444 m instrumented tower and satellite observations augmented a conventional weather radar and a new, dual Doppler weather radar system to obtain concurrent data on weather hazards to aircraft. Storm days and data acquired are detailed. An objective was to determine the characteristics and detectability of turbulence, wind shear and other aircraft operational weather hazards using indirect (radar) probes. The South Dakota School of Mines T-28 aircraft and the National Aeronautics and Space Administration's F-106 aircraft made thunderstorm penetrations during Doppler radar and lightning operations. Data obtained are discussed, and the analysis of a turbulence case and two gust front cases is presented. Author

N82-30806# Air Force Geophysics Lab., Hanscom AFB, Mass. Meteorology Div.

A SURVEY OF MELTING LAYER RESEARCH

Robert C. Schaller, Ian D. Cohen, Arnold A. Barnes, Jr., and Lawrence C. Gibbons 4 Jan. 1982 105 p refs
(AF Proj. 2310)
(AD-A115224; AFGL-TR-82-0007; AFGL-AFSG-438) Avail: NTIS HC A06/MF A01 CSCL 01/3

This report summarizes previous melting-layer research both within and outside AFGL and provides recommendations for future research in the melting layer. An extensive literature search provided a bibliography of previous research. This bibliography is included as an appendix. Several definitions of the top and bottom of the melting layer are presented and discussed. Aggregation and breakup appear to be the chief microphysical processes that determine the particle-size spectrum of snow and ice that enter the melting layer. Studies of the actual melting process and of the melting layer as seen by radar are presented. Microphysical and thermodynamic characteristics are discussed. Dynamic considerations are mentioned. Previously gathered aircraft data are reviewed, and recommendations are made for future aircraft and radar data-gathering efforts. Author (GRA)

N82-30820# National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.

EVALUATION OF A METEOROLOGICAL AIRBORNE PULSE DOPPLER RADAR

B. L. Trotter, R. G. Strauch, and C. L. Frush (National Center for Atmospheric Research) Jul. 1981 65 p
(PB82-156860; NOAA-TM-ERL-WMPO-45; NOAA-81103011) Avail: NTIS HC A04/MF A01 CSCL 04B

Doppler measurements installed in the aircraft which measure the radial velocities in light to heavy precipitation and in nonturbulent to turbulent meteorological situations was evaluated. The base line noise level in the system increased whenever video returns were present. The minimum detectable signal at the system output was approximately minus 100 dBm. It is shown that the system can be used in an airborne environment. Errors in velocity measurements will occur if the exact antenna spacial pointing angle is not known. The magnitude of error in the measurement is a function of the error in the known antenna position and the ground speed of the aircraft. GRA

N82-30838*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

PILOT/VEHICLE MODEL ANALYSIS OF VISUAL AND MOTION CUE REQUIREMENTS IN FLIGHT SIMULATION

R. Lancraft, G. Zacharias, and S. Baron *In* MIT Proc. of the 16th Ann. Conf. on Manual Control 1980 p 66-91 refs

Avail: NTIS HC A99/MF A01 CSCL 14B

The optimal control model for pilot/vehicle analysis is used to investigate the closed-loop consequences of the performance limitations associated with a computer generated image (CGI) visual system and a six degree-of-freedom motion simulator (VMS) in a helicopter hover task. The specific problem addressed was to determine the potential effects of CGI and VMS system characteristics on closed-loop hover performance and pilot workload, and to evaluate these effects in light of performance/workload levels we might expect to see in the actual flight situation. Author

N82-30840*# Systems Technology, Inc., Mountain View, Calif.

TRAINING AIRCRAFT DESIGN CONSIDERATIONS BASED ON THE SUCCESSIVE ORGANIZATION OF PERCEPTION IN MANUAL CONTROL

Robert K. Heffley, Warren F. Clement, and Samuel J. Craig (Vought Corp., Hawthorne, Calif.) *In* MIT Proc. of the 16th Ann. Conf. on Manual Control 1980 p 119-127 refs

Avail: NTIS HC A99/MF A01 CSCL 01C

Pilot skill development in the approach and landing task is very strongly tied to the aircraft closure rate and, therefore, pilot training for this task should be based on an appropriate progression closure rate. This, in turn, leads to a rational and explicit determination of design point approach speeds as well as other important aerodynamic features for training aircraft. One key is to recognize the significance of transitioning from a purely compensatory control loop technique to one involving a pursuit crossfeed between throttle and pitch attitude. Such transitioning requires significant skill development, yet reduces pilot workload while enhancing flight path and airspeed performance. The second key is to address the terminal flight path adjustment in terms of range-to-go. This establishes a bridge between the visual field and the combination of manual control technique and vehicle flight dynamics. A design summary plot is thus created in terms of: (1) performance (flight path bandwidth); (2) critical range-to-go (for terminal path correction); and (3) closure rate. Author

N82-30848# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

EFFECTS OF HIGHER ORDER CONTROL SYSTEMS ON AIRCRAFT APPROACH AND LANDING LONGITUDINAL HANDLING QUALITIES

Muhammad A. Pasha (Pakistan Air Force), John J. DAzo, and James T. Silverthorn *In* MIT Proc. of the 16th Conf. on Manual Control 1980 p 254-264 refs

Avail: NTIS HC A99/MF A01 CSCL 01C

A study of approach and landing longitudinal flying qualities, based on data generated by Calspan using a variable stability NT-33 aircraft combined with significant control system dynamics is presented. An optimum pilot lead time for pitch tracking, flight path angle tracking, and combined pitch and flight path angle tracking tasks is determined from a closed-loop simulation using integral squared error (ISE) as a performance measure. Pilot gain and lead time were varied in the closed-loop simulation of the pilot and aircraft to obtain the best performance for different control system configurations. The results lead to the selection of an optimum lead time using ISE as a performance criterion. Using this value of optimum lead time, a correlation is then found between pilot rating and performance with changes in the control system and in the aircraft dynamics. It is also shown that pilot rating is closely related to pilot workload which, in turn, is related to the amount of lead which the pilot must generate to obtain satisfactory response. The results also indicate that the pilot may use pitch angle tracking for the approach task and then adds flight path angle tracking for the flare and touchdown. Author

N82-30849*# Princeton Univ., N. J. Flight Research Lab.

PILOT OPINIONS OF SAMPLING EFFECTS IN LATERAL DIRECTIONAL CONTROL

Robert F. Stengel and George E. Miller *In* MIT Proc. of the 16th Ann. Conf. on Manual Control 1980 p 265-270 refs

(Contract N00014-78-C-0257)

Avail: NTIS HC A99/MF A01 CSCL 01C

Flight experiments with a microprocessor control system were conducted to determine the effects of variations in sampling parameters on several pilots' opinions of lateral-directional flying qualities. Princeton's Variable Response Research Aircraft, which is equipped with a microprocessor-based digital flight control system was the test vehicle. Two U.S. Navy pilots evaluated the effects of sampling rate, quantization, and pure time delay during tracking, approach, and landing. Aircraft carrier approach tasks were conducted using a Navy approach mirror. Acquisition and tracking of fixed objects on the ground provided additional information related to the Navy mission. Author

N82-30856*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

EVALUATION OF A TRAJECTORY COMMAND CONCEPT FOR MANUAL CONTROL OF CARRIER APPROACHES AND LANDINGS

Walter E. McNeill, G. Allan Smith, Jr., and Ronald M. Gerdes *In* MIT Proc. of the 16th Ann. Conf. on Manual Control 1980 p 370-392 refs

Avail: NTIS HC A99/MF A01 CSCL 01C

A trajectory control system concept for providing manual control of a conventional jet aircraft is described. The total aircraft flight control system (TAFCOS) utilizes an inverse model of the aerodynamic and propulsion characteristics and employs feedforward control to provide the required acceleration command. On-board digital computations which can easily be handled by a modern airborne computer are required. The system was studied in a piloted simulation of the carrier approach and landing task with primarily visual flight and guidance cues. The principal modes of vertical flight path control investigated were vertical velocity command and vertical acceleration command. The study included manual carrier approaches with and without moderate ship motion and associated air disturbances, and tests of the effects of discrete gusts. Manual control of flight path through this concept was shown to be feasible as an addition to an automatic control system and to have potential as an improved mode of control over conventional control for the carrier approach task. The concept also offers several advantages, among which are design flexibility, automatic compensation for external disturbances, and prevention of abusive pilot control. Author

N82-30857*# Systems Technology, Inc., Mountain View, Calif.

APPLICATION OF A PILOT CONTROL STRATEGY IDENTIFICATION TECHNIQUE TO A JOINT FAA/NASA GROUND BASED SIMULATION OF HEAD UP DISPLAYS FOR CTOL AIRCRAFT

Wayne F. Jewell *In* MIT Proc. of the 16th Ann Conf. on Manual Control 1980 p 395-409 refs

(Contracts NAS2-10385; DOT-FA77WAI-725; NASA-NMI-1052.151)

Avail: NTIS HC A99/MF A01 CSCL 01D

The development, evaluation, and application of a technique for measuring a pilot's control strategy is described. The nonintrusive pilot identification program (NIPIP) estimates the pilot's input-output describing function and combined pilot vehicle performance parameters such as crossover frequency and phase margin by using a time domain model of the pilot and a least squares identification algorithm. It functions in realtime and uses a 'sliding' time window to maintain freshness in the data; thus time varying characteristics in the pilot's control strategy can be measured. The application of NIPIP to a realtime ground based simulation of two competing concepts of head up displays (HUD) for use in conventional takeoff and landing aircraft. Differences in the pilot's control strategy used for the two HUDs and the head down display are quantified in terms of differences in the pilots' describing functions and combined pilot vehicle measurements. Conclusions based on the performance evaluation and application of NIPIP are presented and some recommendations on how NIPIP could be used in other manual control tasks are discussed. J.D.

N82-30858*# Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.

DESIGN, SIMULATION AND EVALUATION OF ADVANCED DISPLAY CONCEPTS FOR THE F-16 CONTROL CONFIGURED VEHICLE

Robert W. Klein (Grumman Aerospace Corp., Bethpage, N.Y.)

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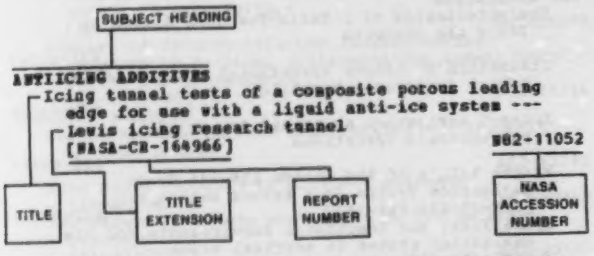
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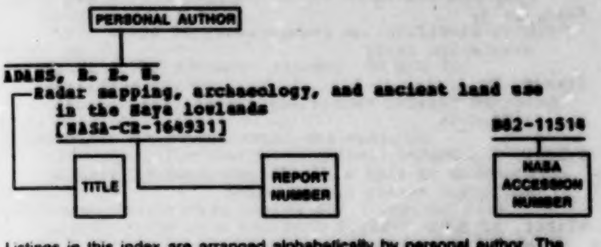

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INTRODUCTION

Under the terms of an interagency agreement with the Federal Aviation Administration this publication has been prepared by the National Aeronautics and Space Administration for the joint use of both agencies and the scientific and technical community concerned with the field of aeronautical engineering. The first issue of this bibliography was published in September 1970 and the first supplement in January 1971.

This supplement to *Aeronautical Engineering – A Continuing Bibliography* (NASA SP-7037) lists 272 reports, journal articles, and other documents originally announced in November 1982 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*.

The coverage includes documents on the engineering and theoretical aspects of design, construction, evaluation, testing, operation, and performance of aircraft (including aircraft engines) and associated components, equipment, and systems. It also includes research and development in aerodynamics, aeronautics, and ground support equipment for aeronautical vehicles.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* and *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Three indexes -- subject, personal author, and contract number -- are included.

An annual cumulative index will be published.

certification is expected in December 1982 for commercial service the following year. A.B.

A82-43278 † Proposed multipurpose flying radio-physical laboratory using an IL-18 aircraft (Perspektivnaia mnogotselevaia radiofizicheskaia letaiushchaia laboratoriia na baze samoleta tipa IL-18). V. S. Abliazov, N. A. Armand, A. N. Beliunov, V. M. Berezanskii, L. F. Borodin, V. L. Bulatnikov, A. N. Vystavkin, A. A. Kalinkevich, A. A. Kirilin, and A. P. Kulakov. *(Vsesoiuznaia Konferentsiia po Problemam Issledovaniia Prirodnykh Resursov Zemli i Mirovogo Okeana Aviatsionno-Kosmicheskimi Sredstvami, Moscow, USSR, Nov. 1980.) Geodeziia i Aerofotos'emka*, no. 2, 1982, p. 11-18. In Russian.

The paper describes an airborne laboratory for performing radio-physical experiments relating to the remote sensing of earth resources and the monitoring of the environment in the microwave, infrared, and visual ranges. Consideration is given to the onboard automated data acquisition system, the radiometer system, and an algorithm for processing and classifying the radiometer data. A picture showing the arrangement of remote-sensing equipment and processing systems on the aircraft is presented along with block diagrams of the data-acquisition and radiometer systems. B.J.

A82-43311 A laser-interferometer method for determining the forces on a freely-flying model in a shock-tunnel. L. Bernstein and G. T. Stott (Queen Mary College, London, England). *Aeronautical Quarterly*, vol. 33, Aug. 1982, p. 237-257. 19 refs.

An interferometric method is developed for following the trajectory of a weakly restrained model in a shock tunnel where the force levels are of order 10N for flow duration of about 1 ms. The system consists of two simple Michelson interferometers and a single He-Ne laser that provides two measurement and reference beams for following the motion of two points on the model. Interference fringes are produced at the detectors as the model moves, and the resulting frequency-modulated wave-trains are recorded. The data are analyzed by curve fitting to a parabola in order to find the accelerations of the measurement points, and the forces on the model are calculated based on the model's internal characteristics. A lift and pitching moment for a ridge-delta of aspect-ratio 1 is obtained by suitably aligning the beams. In addition, results of tests on two models of the same geometric size but with different inertias are presented. N.B.

A82-43326 # The testing of new technologies with the aid of the Alpha Jet aircraft (Erprobung neuer Technologien am Alpha Jet). M. Natter (Dornier GmbH, Friedrichschafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 31 p. In German.

The Alpha Jet aircraft as weapon system of the 1980s and 1990s represents the most modern, operationally utilizable status of technology. The origin of the currently employed technologies goes back to the late 1960s. The present investigation is concerned with recent developments regarding the technologies which determine bomber aircraft design, taking into account the advantages that the new technologies will provide for future bomber aircraft. Technological changes of the 1970s are related to electronics and cybernetics, fluid mechanics and flight physics, and materials and methods of construction. The development, manufacture, and long-term testing of carbon-fiber reinforced plastics is considered, giving attention to the landing flap, rudder, elevator unit, and the wings of the Alpha Jet. The development and flight testing of a transonic wing is discussed, and a description is presented of the development and testing of a direct side force control system. G.R.

A82-43327 # Applied flight mechanics in the design and in flight tests (Angewandte Flugmechanik bei der Auslegung und Flugerprobung). H. Wünnenberg (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 22 p. 5 refs. In German.

It is pointed out that flight mechanics played an important part in connection with the design and the development of the Alpha Jet aircraft. The main criteria involved in a selection of the optimal configuration were related to a satisfaction of the requirements of flight mechanics. The German aerospace company engaged in the Alpha Jet project has already proposed seven alternative configurations for a jet trainer in connection with a prestudy. Factors used in comparing these configurations were related to flight mechanics, system costs, safety, structure, problems of construction, equipment, and employment possibilities as a light weapons system. The degree with which the flight-mechanics requirements were satisfied was determined on the basis of 17 criteria. Attention is also given to the procedures used in the development phase of the aircraft and the test phase. G.R.

A82-43328 # Processes and procedural approaches in the aerodynamic design of the Alpha Jet aircraft (Verfahren und Vorgehensweise bei der aerodynamischen Auslegung des Alpha-Jet). D. Welte (Dornier GmbH, Friedrichshafen, West Germany). Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper. 18 p. In German.

The military aircraft Alpha Jet, which has been developed jointly by a French and a German aerospace company, is to be used as a training aircraft for novices and advanced students, and also as a combat aircraft to provide support to troops fighting on the ground. A description is presented of the approaches used to develop a design which will ensure the aerodynamic characteristics required by the aircraft to perform its missions. Attention is given to aspects of wing design, aids for obtaining satisfactory lift characteristics, engine inlets, jet effects, and a wind tunnel program. G.R.

A82-43330 # Aerodynamic computational procedures for subsonic and transonic aircraft (Aerodynamische Berechnungsverfahren für Unterschall- und Transschallflugzeuge). W. Schmidt. (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 25 p. 22 refs. In German.

The improvement of the flight characteristics of modern aircraft has been accompanied by a considerable increase in the aircraft development costs. Current procedures in connection with the aerodynamic design are still characterized by wind-tunnel studies. The use of modern aerodynamic computational processes will make it possible to restrict cost-intensive wind tunnel tests in the future to tests related to the verification of configuration characteristics and the determination of maneuverability properties. The development of the Alpha Jet aircraft is used as an example to show the advances which have been made regarding the development of aerodynamic computational procedures since the period from 1969 to 1973. Attention is given to the aerodynamic sizing program, the predesign of the wing-fuselage combination, profile design for sonic and transonic conditions, the design of flap systems, the design of engine inlets, and the aerodynamic design of the tail assembly. G.R.

A82-43331 # Processes and procedural approaches used in the dimensioning of the supporting structure and the demonstration of the airworthiness (Verfahren und Vorgehensweise bei der Dimensionierung der Tragstruktur und beim Nachweis der Lufttüchtigkeit). E. Hässler (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 26 p. In German.

The airworthyness of an aircraft is related to the ability of the airframe of the aircraft to tolerate the stresses occurring in flight operations in a satisfactory manner. On the other hand, a strength of the airframe exceeding the requirements to a large degree is also undesirable in connection with a corresponding unnecessary increase in the weight of the aircraft. The present investigation is concerned with the approaches used to obtain an airframe with optimum design characteristics, taking into account the procedures employed in connection with the design of the Alpha Jet aircraft. Attention is given to details regarding the airworthyness requirements in the case of the Alpha Jet, the optimal dimensioning of the airframe, questions of load mechanics, the structural calculations, and approaches for ensuring appropriate quality. G.R.

A82-43332 # A survey regarding the German-French development program Alpha Jet (Überblick über das deutsch-französische Entwicklungsprogramm Alpha Jet). P. Kania (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 27 p. In German.

The project Alpha Jet has its origin in the late 1960s, when in Germany and in France a need for a new jet trainer for the air force was recognized. Initial contacts between German and French aerospace companies in 1968 led to plans for the development of the Alpha Jet aircraft in a joint project by French and German companies. In response to the need of the 'Luftwaffe' for a combat aircraft providing close-air support, the development objectives for the Alpha Jet were extended to cover also requirements concerning an employment of the aircraft for combat missions. In September 1975, Belgium became the third partner in the Alpha Jet project. The last of four prototypes of the Alpha Jet performed its first flight on October 11, 1974. Attention is given to details concerning the implementation of the Alpha Jet program, organizational questions, aspects of the program schedule, financial considerations, and an outlook regarding future developments involving the Alpha Jet. G.R.

A82-43333 # Simulation in connection with the development of the Alpha Jet aircraft (Simulation bei der Entwicklung des Alpha Jet). H. Friedrich (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft für Luft- und Raumfahrt, Symposium über angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981. Paper.* 37 p. In German.

A survey is provided of simulation studies conducted by a German aerospace company as an aid in the development of the Alpha Jet military aircraft. The first simulations were unmanned simulations, involving six degrees-of-freedom calculations. The simulation, including preprogrammed control input data or simulated pilot behavior, was performed by a digital computer. At a later time, a cockpit mock-up was provided with control elements and instruments, and the resulting installation was connected with a digital computer. In this connection, an operational simulator was developed. This simulator is used for air/ground mission applications. Investigations involving manned simulations are also discussed. Manned simulations were almost exclusively performed in connection with the adaptation of the aircraft to modified and new missions. The simulator is principally employed for mission simulations and the study of new control concepts. G.R.

A82-43394 Sensitivity analysis and optimization of aeroelastic stability. A. P. Seiranian. *International Journal of Solids and Structures*, vol. 18, no. 9, 1982, p. 791-807. 42 refs.

An analysis of the sensitivity characteristics of aeroelastic stability with respect to changes of distributed and discrete parameters is presented using variational analysis. The optimization problem of aeroelastic stability of a slender wing in incompressible flow is formulated and the solution demonstrates that this problem possesses at least two extrema, but that one of them is only a local maximum. Sensitivity analysis of flutter systems is developed by deriving the gradients of flutter and divergence critical speeds, and obtaining the necessary optimality conditions. The solution technique is then described and numerical results are presented. The optimality conditions for the distribution of nonstructural mass along the wing span are established and the bang-bang optimal distributions are obtained. N.B.

A82-43400 # Methodology in flight tests (Methodik bei der Flugerprobung). U. von Meier (Dornier GmbH, Friedrichshafen, West Germany). *Deutsche Gesellschaft fur Luft- und Raumfahrt, Symposium uber angewandte Flugwissenschaften bei der Entwicklung des Alpha Jet, Darmstadt, West Germany, Sept. 24, 1981, Paper.* 19 p. In German.

Cost considerations in connection with the conduction of flight tests make it necessary to conduct performance and property measurements, individual system tests, and flutter studies during the same flight. Flight tests conducted with the Alpha Jet aircraft provide a good example for efficient bilateral flight testing procedures. Four prototypes were used in the flight tests. Attention is given to the assignment of the various test problems to the Alpha Jet prototypes, the flight program for the test flights, aspects of performance evaluation, the excitation of structural vibration and the evaluation of the vibrations for the flutter analysis, and a survey concerning the testing of the weapons of the aircraft. G.R.

A82-43402 Mode scatterer design for fan noise suppression in two-dimensional ducts. M. S. Tsai (Boeing Commercial Airplane Co., Seattle, WA). *Journal of Sound and Vibration*, vol. 83, Aug. 22, 1982, p. 501-512. 11 refs.

The favorable scattering associated with the transfer of the lower order modal energies to the higher ones can be induced only when (1) the lower frequency waves propagate in the inlet duct or in the no mean flow conditions, and (2) the first lining which the incident waves from the fan face meet is a nearly reactive one. The phases of the incident waves from the noise source will affect the performance of the scatterer, but not the selection of the optimized scatterer. For a given baseline lining, the reactance and the length of the scatterer are the coupling factors in the determination of an optimized scatterer. (Author)

A82-43425 Northrop ECM - From B-1B to F-5E. D. Richardson. *Flight International*, vol. 122, Sept. 4, 1982, p. 683, 684, 693.

Several electronic countermeasures systems are described. The B-1 RFS/ECM jamming transmitter system has been extended to cover Band 8, as well as 6 and 7; in-phase power stacking allows the output of individual jamming sources to be combined, and phased array antennas are employed. The ALQ-171 (V) conformal countermeasures system, designed for the F-5, has a minimal effect on aircraft performance, reducing the maximum Mach number less than 4 percent at 36,000 feet. Continuous-power amplitude-modulation noise, a constant-power AM pulse repeater, and a continuous wave repeater are employed singly or in combination, and are effective against multiple threats. Future developments include the Modularised Infrared Transmitting Set consisting of an infrared transmitter and electronic control unit which provides 180 degree countermeasures coverage. A.B.

A82-43458 A field guide for scanner and photographic missions. D. L. Hawley (EG & G, Inc., Multispectral Remote Sensing Dept., Las Vegas, NV). In: American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Technical Meeting, San Francisco, CA, September 9-11, 1981 and Honolulu, HI, September 14-16, 1981, ASP Technical Papers. Falls Church, VA, American Society of Photogrammetry, 1981, p. 513-530. 6 refs.

The guide comprises separate sections for planning, executing, and evaluating a multispectral scanner and/or photographic mission. The planning section addresses mission objectives, mission requirements, navigation, flight briefing, weather, communications, field/aircraft equipment, and logistics. The mission requirements deal with general flight parameters of sunrise, sunset, equation of time, solar altitude, solar azimuth, duration of daylight, duration of civil twilight, duration of astronomical twilight, flight line headings, flight altitude, flight line coverage, flight line interval, and number of flight lines. Among the scanner parameters discussed are the velocity/height ratio, scanner speed, and tape speed. Navigation techniques are described, together with aircraft considerations. C.R.

A82-43465 Loran-C navigation as an aid to aerial photographic operations. C. W. Dull (U.S. Department of Agriculture, Forest Service, Doraville, GA) and W. H. Clerke (U.S. Department of Agriculture, Forest Service, Atlanta, GA). In: American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Technical Meeting, San Francisco, CA, September 9-11, 1981 and Honolulu, HI, September 14-16, 1981, ASP Technical Papers. Falls Church, VA, American Society of Photogrammetry, 1981, p. 531-541. 13 refs.

The navigational accuracy obtained during a wide variety of operational aerial photographic missions utilizing a Loran-C TDL-424 navigator is evaluated. The navigational displays, steering, and data outputs are discussed, and the parallel track steering and preprogrammed flight pattern are shown. The navigational accuracy evaluation includes a parallel flightline evaluation for three missions, a comparison of an aerial photographic mission with and without Loran-C, evaluation of return flight accuracy for a predescribed flightline, and overflights of predetermined exposure stations. C.D.

A82-43571 # Implicit model-following technique - Application to the design of longitudinal stability augmentation systems. V. Mocanu (National Institute for Scientific and Technical Research, Bucharest, Rumania). *Revue Roumaine des Sciences Techniques, Série de Mécanique Appliquée*, vol. 26, Nov.-Dec. 1981, p. 845-853. 13 refs.

Implicit model-following and static decoupling techniques are applied to the design of a control and stability augmentation system for a control-configured, relaxed static stability version of the F-4 aircraft. Implicit model-following allows the computation of the optimal feedback law which minimizes differences between aircraft and model dynamics for the cases of distinct flying qualities. The static decoupling technique is used for the computation of a feedforward matrix which decouples the steady state system outputs. O.C.

A82-43577 Technology for tomorrow's business aircraft. M. Grangier. *Interavia*, vol. 37, Sept. 1982, p. 875, 876.

Improvements of business aircraft by the end of the decade are forecast, which pertain to their structure, aerodynamics, propulsion and avionics. The increased use of composite materials in place of metal should reduce the empty weight of aircraft about 20 percent, but problems with testing and residual strength after damage must be resolved. Aerodynamic changes may include the use of new wing shapes, canard foreplanes, and wings with relative thicknesses of more than 15 percent at the root, aspect ratios over 10, and a sweep of 35 percent or more. It is hoped that engine power output will be increased 30 percent over current units by increasing the bypass ratio or by modifying the fan blade shape. Improved energy efficiency is to be expected from all of these changes. A.B.

A82-43578 Piston engines for general aviation - Is the revolution really under way. M. Grangier. *Interavia*, vol. 37, Sept. 1982, p. 898-900.

The search for higher efficiency, lower fuel consumption engines for general aviation is prompting the consideration of alternative fuels and engine designs. The Thunder engine, based on a McLaren/Chevrolet 8 cylinder automobile engine, is being developed to produce 700 HP at 4,400 rpm with fuel consumption of 0.40 pounds/HP/ hour and to run on a variety of fuels. Liquified petroleum gas is an attractive alternative fuel because its cost is 40-60 percent less than aviation gasoline with less pollution and engine carbon deposits; conversion of conventional engines is relatively simple, and it does not alter the flying characteristics of an aircraft. Alcohol is a possible fuel, but it gives lower engine performance than gas and could call for altitude restrictions. Diesel power is being considered through a 2 stroke 4 cylinder star configuration diesel for NASA. Finally, weight and cooling present problems to be overcome, as well as the high pressure fuel injection system necessary. A.B.

A82-43579 The cruise missile era dawns. J. P. Geddes. *Interavia*, vol. 37, Sept. 1982, p. 919-923.

In December 1982, 192 cruise missiles will be deployed on 16 B-52's, and will be the first out of over 4,000. In addition to the ALCM, the Tomahawk SLCM will be produced in several versions for surface launch, submarine launch and ground launch, the last of which will become operational in mid-1984. All these versions employ common propulsion and internal guidance systems with Terrain Contour Matching, and have a cruise speed of 550 mi/h and a range of 1550 nmi. A fifth version, the Medium Range Air-to-Surface Missile, will become operational in late-1986. The size of the anticipated production is made possible by the missile's low cost (about $1 million), and is made necessary by its vulnerability, considering and Walter M. Hollister *In its* Proc. of the 16th Ann. Conf. on Manual Control 1980 p 424-438 refs

(Grant AF-AFOSR-3260-78)
Avail: NTIS HC A99/MF A01 CSCL 01D

The F-16 control configured vehicle (CCV) flight test program, and current aircraft display research are reviewed and task oriented and compensatory displays to further enhance the capability of the F-16 CCV are suggested. The fixed base M.I.T. 707 simulator was modified to represent the F-16 CCV. An isometric sidearm control stick and two axis CCV thumb button were installed in the cockpit. The forward cockpit CRT was programmed to present an external scene (numbered runway, horizon) and the designed heads up display. The cockpit interior was modified to represent a fighter and the F-16 CCV dynamics and direct lift and side force modes were programmed. Compensatory displays were designed from man/machine considerations. Pilots evaluated the heads up display and compensatory displays during simulated descents in the presence of several levels of filtered, zero mean wind gusts. During a descent from 2500 feet to the runway, the pilots tracked a point on the runway utilizing the basic F-16, F-16 CCV, and F-16 CCV with advanced displays. Substantial tracking improvements resulted utilizing the CCV modes, and the displays were found to even further enhance the tracking ability of the F-16 CCV. J.D.

N82-30860*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SEPARATION MONITORING WITH FOUR TYPES OF PREDICTORS ON A COCKPIT DISPLAY OF TRAFFIC INFORMATION
Sharon Jago and Everett Palmer *In* MIT Proc. of the 16th Ann. Conf. on Manual Control 1980 p 439-447 refs

Avail: NTIS HC A99/MF A01 CSCL 01D

The concept of a cockpit display of traffic information (CDTI) includes the integration of air traffic, navigation, terrain and weather information in a single electronic display in the cockpit. Investigations designed to develop a clear and concise display format for use in later full mission simulator evaluation of the CDTI concept are described. The experiment required airline pilots to monitor a CDTI and make perceptual judgments concerning the future position of a single intruder aircraft in relationship to their own aircraft (ownship). The main experimental variable was the type of predictor used to display future position of each aircraft. Predictors were referenced to the ground or to ownship and they either included turn rate information or did not. Other variables were the aircraft's separation distance when the judgment was required and the type of encounter (straight or turning). Results indicate that under these experimental conditions fewer errors were made when the predictor included turn rate information. There was little difference in overall error rate for the curved ground referenced and the ownship referenced predictors. Author

N82-30953# Naval Training Equipment Center, Orlando, Fla. Computer Systems Lab.
COMPUTER ARCHITECTURE STUDY FOR VTXTS SIMULATORS Final Report, Mar. - Nov. 1981
Leonard D. Healy, Gerald A. Wyndle, and Bruce Baker (Servos and Simulation, Inc.) Apr. 1982 123 p refs
(AD-A115006; NAVTRAEQUIPC-IH-336) Avail: NTIS HC A06/MF A01 CSCL 09/2

This report provides an evaluation of computer configurations that might be applied to VTXTS simulators. Computers ranging from the large, general purpose computer ordinarily used in data processing to the microcomputer which requires 40 separate units to implement a simulator complex are considered. Eleven computer configurations are evaluated with respect to availability, maintenance, expandability, risk and life cycle cost. The information is summarized in a table of advantages and disadvantages of the various configurations. Author (GRA)

N82-30954# Naval Training Equipment Center, Orlando, Fla. Computer Systems Lab.
DESIGN OF A MICROPROCESSOR-CONTROLLED LINKAGE FOR SIMULATOR APPLICATIONS Final Report, Oct. 1980 - Jun. 1981
Leonard D. Healy Apr. 1982 82 p
(AD-A115421; NAVTRAEQUIPC-IH-334) Avail: NTIS HC A05/MF A01 CSCL 09/2

This report describes a method of linking a host computer to external devices and presents an implementation of such a system using multiple microcomputers. The technique used takes advantage of the statistical properties of simulator data to reduce the amount of data transferred, thereby insuring that those variables that change are updated with minimum delay. Implementation of linkage using multiple microcomputers provides a modular system easily tailored to various simulator applications. Author (GRA)

N82-30962*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ADVANCED RELIABILITY MODELING OF FAULT-TOLERANT COMPUTER-BASED SYSTEMS
Salvatore J. Bavuso May 1982 33 p refs
(NASA-TM-84501; NAS 1.15:84501) Avail: NTIS HC A03/MF A01 CSCL 09B

Two methodologies for the reliability assessment of fault tolerant digital computer based systems are discussed. The computer-aided reliability estimation 3 (CARE 3) and gate logic software simulation (GLOSS) are assessment technologies that were developed to mitigate a serious weakness in the design and evaluation process of ultrareliable digital systems. The weak link is based on the unavailability of a sufficiently powerful modeling technique for comparing the stochastic attributes of one system against others. Some of the more interesting attributes are reliability, system survival, safety, and mission success.

N82-31066*# Man-Acoustics and Noise, Inc., Seattle, Wash.
A STUDY OF GENERAL AVIATION COMMUNITY NOISE IMPACT AND ANNOYANCE Final Contractor Report, Sep. 1979 - Apr. 1982
J. E. Mabry Apr. 1982 45 p refs
(Contract NAS1-15896)
(NASA-CR-165945; NAS 1.26:165945; MAN-1045) Avail: NTIS HC A03/MF A01 CSCL 20A

The method involved the selection of three airports which were dominated by aircraft weighing 12,500 lbs or under and which were also undergoing a change relative to utilization. Also, there was interest in airports with different utilization levels so that effect of number of operations could be considered. In addition, there was a requirement to select airports with communities in the surrounding areas which were exposed to aircraft operations noise. Noise annoyance response data was obtained from available sources. These sources included environmental impact statements, interviews with airport managers, noise complaint information, community meetings concerned with projected changes in airport utilization, and social survey data. As a means of objectively assessing the noise impact due to aircraft operations, noise measurement and computer noise modeling determinations were obtained for each airport. Listening quality tape recordings were also obtained. Author

N82-31069*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NOISE TRANSMISSION LOSS OF AIRCRAFT PANELS USING ACOUSTIC INTENSITY METHODS
Michael C. McGary Aug. 1982 37 p refs
(NASA-TP-2046; L-15306; NAS 1.60:2046) Avail: NTIS HC A03/MF A01 CSCL 20A

The two-microphone, cross-spectral, acoustic intensity measurement technique was used to determine the acoustic transmission loss of three different aircraft panels. The study was conducted in the transmission loss apparatus in the Langley aircraft noise reduction laboratory. Author

N82-31070*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AIRPORT/COMMUNITY NOISE
David G. Stephens, comp. 1982 40 p Proceedings of a Workshop held at Hampton, Va., 25-26 Feb. 1982
(NASA-CP-2241; L-1545; NAS 1.55:2241) Avail: NTIS HC A03/MF A01 CSCL 13B

Airport noise and community planning for noise compatibility were discussed. For individual titles, see N82-31071 through N82-31074.

N82-31071*# Douglas Aircraft Co., Inc., Long Beach, Calif.
AIRPORT NOISE
Robert E. Pendley *In* NASA. Langley Research Center

Airport/Community Noise 1982 p 2-12

Avail: NTIS HC A03/MF A01 CSCL 13B

The problem of airport noise at several airports and air bases is detailed. Community reactions to the noise, steps taken to reduce jet engine noise, and the effect of airport use restrictions and curfews on air transportation are discussed. The adverse effect of changes in allowable operational noise on airport safety and altenative means for reducing noise pollution are considered. Community-airport relations and public relations are discussed. J.D.

N82-31072*# Georgia Inst. of Tech., Atlanta.
COMMUNITY NOISE
Clifford R. Bragdon *In* NASA. Langley Research Center Airport/Community Noise 1982 p 13-29

Avail: NTIS HC A03/MF A01 CSCL 13B

Airport and community land use planning as they relate to airport noise reduction are discussed. Legislation, community relations, and the physiological effect of airport noise are considered. Noise at the Logan, Los Angeles, and Minneapolis/St. Paul airports is discussed. J.D.

N82-31073*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUMMARY OF AIRPORT TECHNOLOGY NEEDS
Homer G. Morgan *In its* Airport/Community Noise 1982 p 30

Avail: NTIS HC A03/MF A01 CSCL 13B

The need for improvement in airport noise assessment methodology is summarized and specific investigations of the relationship between noise level and individual and community response outlined. J.D.

N82-31074*# Georgia Inst. of Tech., Atlanta.
SUMMARY OF COMMUNITY TECHNOLOGY NEEDS
Clifford R. Bragdon *In* NASA. Langley Research Center Airport/Community Noise 1982 p 31-33

Avail: NTIS HC A03/MF A01 CSCL 13B

Applications of the social sciences and engineering to solution of the problem of airport noise are summarized. Specific needs are outlined. J.D.

N82-31147*# National Aeronautics and Space Administration, Washington, D. C.
PRESENT CHALLENGES OF RESEARCH AND TECHNOLOGY POLITICS
Andreas V. Bulow May 1982 12 p Transl. into ENGLISH from DFVLR-Nachr. (West Germany), no. 35, Mar. 1982 p 3-5 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76720; NAS 1.15:76720) Avail: NTIS HC A02/MF A01 CSCL 05A

Research and technology in Germany are discussed. The rapid transfer of scientific knowledge and techniques from the laboratory to the manufacturing and industrial communities is indentified as a priority. It is recommended that the government give maximum support to the aviation and space flight industries. R.J.F.

N82-31153*# National Aeronautics and Space Administration, Washington, D. C.
EXTRACTS FROM PROBLEMS OF AIR LAW, A COLLECTION OF WORKS OF THE SECTION OF AIR LAW OF THE AVIAKHIM SOCIETY OF THE USSR AND AVIAKHIM RSFSR
P. I. Baranov, ed., V. A. Zarzar, ed., Ye. A. Korovin, ed., V. L. Lakhtin, ed., and A. V. Sabanina, ed. Jun. 1982 25 p Transl. into ENGLISH from the book "Voprosy Vozdushnogo Prava. Sbornik Trudov Sektsii Vozdushnogo Prava Soyuza Aviakhim SSSRi Aviakhim RSFSE" Moscow, Aviakhim Press, 1927 p 89-110 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76913; NAS 1.15:76913) Avail: NTIS HC A02/MF A01 CSCL 05D

The difficulties of developing a body of international law to govern air travel is discussed. A summary of literature and agreements is presented as well as a brief history. Air space over the poles and the legality of methods of claiming territory in the polar regions is discussed. R.J.F.

N82-31156*# Detroit Diesel Allison, Indianapolis, Ind.
CERAMIC APPLICATIONS IN TURBINE ENGINES Semiannual Report, 1 Jan. - 30 Jun. 1980
S. Michael Hudson, Michael A. Janovicz, and Franklin A. Rockwood Nov. 1980 177 p
(Contracts DEN3-17; EC-77-A-31-1040)
(NASA-CR-165197; NAS 1.26:165197; EDR-10383) Avail: NTIS HC A09/MF A01 CSCL 13F

The design and testing of gas turbine engines employing ceramic components is discussed. Thermal shock and vibration test results as well as spin tests of various engine components are discussed. R.J.F.

N82-31291# Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
AERONAUTICAL SYSTEMS TECHNOLOGY NEEDS: ESCAPE, RESCUE AND SURVIVAL, TEST FACILITIES AND TEST EQUIPMENT AND TRAINING/SIMULATION EQUIPMENT Annual Report, CY 1982
Mark A. Moon Feb. 1982 86 p refs Supersedes ASD-TR-82-5001
(AD-A115435; ASD-TR-82-5001-Rev) Avail: NTIS HC A05/MF A01 CSCL 01/3

This report is a part of a compilation of formalized Technology Needs (TN) covering Equipment Subsystems as identified in the Aeronautical Systems Division. They are based on development/operational experience, systems studies and new concepts - all related to future system applications. Their presentation is to serve a threefold purpose: i.e., (1) guidance for technology program, (2) prove developmental potential, and (3) engineering data/requirements essential for technology use in systems. The identified needs delineate progress desired in performance, control, design flexibility, safety and cost. Author (GRA)

N82-31294*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NOISE AND ECONOMIC CHARACTERISTICS OF AN ADVANCED BLENDED SUPERSONIC TRANSPORT CONCEPT
John K. Molloy, William D. Grantham, and Milton J. Neubauer, Jr. Sep. 1982 32 p refs
(NASA-TP-2073; L-15297; NAS 1.60:2073) Avail: NTIS HC A03/MF A01 CSCL 01B

Noise and economic characteristics were obtained for an advanced supersonic transport concept that utilized wing body blending, a double bypass variable cycle engine, superplastically formed and diffusion bonded titanium in both the primary and secondary structures, and an alternative interior arrangement that provides increased seating capacity. The configuration has a cruise Mach number of 2.62, provisions for 290 passengers, a mission range of 8.19 Mm (4423 n.mi.), and an average operating cruise lift drag ratio of 9.23. Advanced operating procedures, which have the potential to reduce airport community noise, were explored by using a simulator. Traded jet noise levels of 105.7 and 103.4 EPNdB were obtained by using standard and advanced takeoff operational procedures, respectively. A new method for predicting lateral attenuation was utilized in obtaining these jet noise levels. Author

N82-31295*# United Technologies Research Center, East Hartford, Conn.
A DOUBLET LATTICE METHOD FOR THE DETERMINATION OF ROTOR INDUCED EMPENNAGE VIBRATION AIRLOADS. ANALYSIS DESCRIPTION AND PROGRAM DOCUMENTATION
Santu T. Gangwani Jun. 1982 68 p refs
(Contract NAS1-16058)
(NASA-CR-165893; NAS 1.26:165893; UTRC81-7) Avail: NTIS HC A05/MF A01 CSCL 01A

An efficient state-of-the-art method was developed to determine the unsteady vibratory airloads produced by the interaction of the main rotor wake with a helicopter empennage. This method was incorporated into a computer program, Rotor Induced Empennage Vibration Analysis (RIEVA). The program requires the main rotor wake position and the strength of the vortices locates near the

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exposure to enemy counter-measures for some three hours before reaching target. Nuclear arming requires 24 flight events, and occurs only in the target area. Future developments center on enabling small engines to run at 3000 C for more power and range. A.B.

A82-43583 **What has hypersonics research led to - Some examples of progress and spin off /17th Handley Page Memorial Lecture/.** J. L. Stollery (Cranfield Institute of Technology, Cranfield, Beds., England). *Aerospace* (UK), vol. 9, Sept. 1982, p. 14, 15, 21-26. 23 refs.

Hypersonic flight poses considerable problems due to the high kinetic heating, the great power required, and the difficulties in maintaining structural integrity. Temperatures over 1000 K are encountered, and installed thrust must equal maximum takeoff weight. The retractable spike on the Trident Missile was one of the first applications of a technique which prevents the boundary layer from becoming a bow shockwave, and reduces kinetic heating. Because no wind tunnel duplicates all the aspects of hypersonic flight, the flights of the Space Shuttle provided the opportunity to evaluate theoretical predictions of the aerodynamic conditions at speeds from Mach 27 to 0.9. Spin-offs from hypersonic research include the intermittent shock tube and the gasdynamic laser as well as developments for power cells and magnetohydrodynamics. A proposed laser powered hypersonic aircraft is also discussed. A.B.

A82-43588 **Aeronautical research and development in Europe - Perspectives (La recherche et le développement aéronautiques en Europe - Perspectives).** J. C. Wimpenny (British Aerospace Public, Ltd., Co., Aircraft Group, Kingston-upon-Thames, Surrey, England). *(Journée des Pionniers Européens, 7th, Toulouse, France, May 6, 1982.) L'Aéronautique et l'Astronautique,* no. 94, 1982, p. 3-15. In French.

Processes of design-to-cost, construction, and use of aircraft up to the year 2000 are discussed, with attention given to the purposes, directions, and constraints on research and development. Factors influencing the commercial R&D activities are identified as competition and increases in the market, which should expand at least over the extent of the period covered. The demand for new services is driven by attempts to capture markets outside the country of origin, faster flights between locations, and the cost of operations. Raises in fuel costs create new markets for manufacturers to satisfy demands of commercial customers for greater flight economy. Collaborative efforts by different European companies in R&D activities are reviewed, along with specific program goals to lower manufacturing costs and extend the lifetime of the aircraft. M.S.K.

A82-43589 **Parietal jets. I (Les jets pariétaux. I).** L. Rosenthal (Centre de Documentation de l'Armement, Paris, France). *L'Aéronautique et l'Astronautique,* no. 94, 1982, p. 17-30. 25 refs. In French.

Analytical models are explored for the characteristics of jet flow over a wall in order to describe the performance features of parietal jets in varying applications. Attention is given to physically modeling the characteristics of the Coanda and Young effects, particularly in the case of a jet exhaust directed over an inclined flat plate. Experimental studies with free stream velocities equal to zero are reviewed, and numerical models for conditions where the freestream velocity is not equal to zero are noted to require either an integral or a finite difference method for solution of the separation point. Applications of the parietal jets in helicopter blades, STOL aircraft, engines, thrust reversers, and fluidics are mentioned. M.S.K.

A82-43603 † **Survey and design of airfields (Izyskaniia i proektirovanie aerodromov).** G. I. Glushkov, V. F. Babkov, L. I. Goretskii, and A. S. Smirnov. Moscow, Izdatel'stvo Transport, 1981. 616 p. 15 refs. In Russian.

The fundamentals of airfield and airport design are reviewed with reference to the current requirements and standards, including those of ICAO and State Standard of the USSR, and results of the latest research in this area. Topics discussed include airport layout, calculation of the airfield size, vertical planning of the airfield, drainage systems, design of airfield pavements, design of unpaved airfields, heliports, airfields for VTOL aircraft, and, finally, surveying and project development. V.L.

A82-43659 **NASA studies business aircraft avionics.** B. M. Elson. *Aviation Week and Space Technology,* vol. 116, Apr. 26, 1982, p. 119, 121, 125 (4 ff.).

NASA is evaluating an approach to digital avionics using as a testbed a two-engine Cessna 402B equipped with a demonstration advanced avionics system (DAAS). DAAS functions include autopilot/flight directing, navigation/flight planning, flight warning, and weight and balance computations, and examples of system capabilities are air traffic control Mode S message processing, built-in testing, and ground simulation. Built around eight bus-connected microprocessors, DAAS uses digital implementations of the algorithms used for defining the analog autopilot, and incorporates some KFC 300 features. Selector switch, bug selection, and wind velocity are also considered. Cost constraints impose the storage of 10 navigation aids and 10 waypoints, and the use of a small CRT, but some research is being done in flat panel technology and also the use of low-cost inertial sensors should compensate for these problems. R.K.R.

A82-43660 # **Theoretical and experimental investigation of some nonlinear characteristics of electrohydraulic servovalves (Theoretische und experimentelle Untersuchung einiger nichtlinearer Eigenschaften elektrohydraulischer Servoventile).** M. Rizk. Stuttgart, Universität, Fakultät für Luft- und Raumfahrttechnik, Dr.-Ing. Dissertation, 1981. 119 p. 29 refs. In German.

Electrohydraulic control methods are used in a number of applications, including those related to positioning operations performed in connection with the control of aircraft. These control methods are based on the employment of electrohydraulic servovalves. The characteristics of the servovalves have an essential effect on the system behavior. However, the information available concerning the nonlinearities with respect to these characteristics is in many respects insufficient. The present investigation is concerned with a theoretical and experimental study of all possible nonlinear characteristics of electrohydraulic servovalves, with the exception of hysteresis. An open loop control system was built for the conduction of the experiments. The effect of the bypass choke valve on the pressure sensitivity of the first hydraulic stage is calculated, while aspects of hydraulic stiffness in the second stage are experimentally studied. Attention is given to the effect of magnetic and hydraulic saturation on valve characteristics, the effect of manufacturing tolerances, and the effect of the supply pressure. G.R.

A82-43724 # **An examination of the dynamics of rotary machines (Contribution à l'étude dynamique des machines tournantes).** R. Henry. Lyon I, Université, Docteur d'Etat ès-Sciences Thesis, 1981. 167 p. 74 refs. In French.

Numerical models are developed and tested experimentally for accuracy in modeling static and dynamic behaviors of disk-blade systems in conditions of equal or unequal rigidity of the disks and blades. The static and dynamic analyses of thin blades in rotation are carried out through a finite element method, with the choice of elements, boundary values, and matrices being discussed. Attention is given to the calculation of frequencies and modes of repetitive circular systems, with mention made of potential and kinetic energy analyses of substructures using reduced matrices. A computer program, DISCO, is introduced and applied to a disk-blade lattice and an annular plate. The frequencies and modes of an industrial centrifugal compressor wheel are calculated and compared to data, and an accuracy of 5 percent is demonstrated to be possible at cost effective levels of computation. M.S.K.

A82-43742 **A fatigue crack growth theory based on strain energy density factor.** R. Badaliance (McDonnell Aircraft Co., St. Louis, MO). In: Absorbed specific energy and/or strain energy density criterion; Proceedings of the International Symposium, Budapest, Hungary, September 17-19, 1980. The Hague, Martinus Nijhoff Publishers, 1982, p. 329-345. 7 refs.

The strain energy density at the crack tip is used to characterize the fatigue crack growth behaviro of metallic materials. Having postulated that the rate of crack propagation is a function of the range of the strain energy density, this range is used to correlate subcritical growth data of certain aluminums, titaniums, and steels. A parameter which incorporates yield stress, true ultimate stress, and stress ratio is devised to account for stress ratio effects. A single crack growth curve for each material is developed by numerical procedures, and these constant amplitude curves are then used in conjunction with cycle-by-cycle integration schemes to predict spectrum fatigue lives of center cracks and elliptic surface flaws in plates subjected to fighter aircraft landing gear stress history. The results show good agreement with data from experimental tests. N.B.

A82-43753 # **An implicit finite-volume method for solving the Euler equations.** A. Lerat (Ecole Nationale Supérieure d'Arts et Métiers; Paris VI, Université, Paris, France), J. Sidès, and V. Daru (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(Conférence Internationale sur les Méthodes Numériques en Dynamique des Fluides, 8th, Aachen, West Germany, June 28-July 2, 1982.) ONERA, TP* no. 1982-59, 1982. 8 p. 10 refs.

Although the explicit methods which have been developed for the solution of steady or unsteady transonic flow Euler equations allow the prediction of supercritical flows around airfoils without restriction on shock wave strength and motion, they are computing time-intensive due to the limitation on the time step required for numerical stability. This limitation is removed through the application of the present, second-order and noniterative implicit method for the solution of Euler equations. An important feature of the present method is that the implicit terms are of the order of the truncation error, allowing simpler and easier treatment of boundary conditions. The method is expressed in the finite volume formulation and applied to both steady and unsteady transonic flows. The computing time reduction achieved while obtaining accurate results is noted. O.C.

A82-43755 # **Laser Doppler anemometry applied to the study of the airflow in the wake of an helicopter rotor.** B. Sellier and J. Pigere (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(International Symposium on Applications of Laser-Doppler Anemometry to Fluid Mechanics, Lisbon, Portugal, July 5-7, 1982.) ONERA, TP* no. 1982-61, 1982. 12 p. 6 refs.

The equipment, instrumentation and results of a laser Doppler anemometry study of helicopter rotor wake airflow are described. Azimuthal and radial distributions of vertical induced velocities and tip vortex paths are determined for the cases of hovering and forward flight. Attention is given to the arrangement of the laser velocimeter system and the data acquisition system, which can operate in both a 'wake' and a 'histogram' mode. The former simultaneously obtains the two induced velocities and the angular position of the blade, while in the latter, velocities are measured for one given azimuthal blade location. O.C.

A82-43756 # **Preliminary experiments on a centrifugal research compressor using a laser -2- focus velocimeter.** J. Labbe, G. Janssens, and P. Avram (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(International Symposium on Applications of Laser-Doppler Anemometry to Fluid Mechanics, Lisbon, Portugal, July 5-7, 1982.) ONERA, TP* no. 1982-62, 1982. 10 p. 5 refs.

Laser velocimetry methods suitable for the measurement of turbomachine flow velocities must take into account the periodicity of rotation and minimize secondary effects caused by laser light reflection from shroud, hub and impeller surfaces. These difficulties are greatest in centrifugal compressors due to shape of the casing, blade geometry, and the complexity of flow geometry near the blade tips. A two-focus laser velocimeter is described whose mean values, measured outside the centrifugal compressor impeller studied, are in accordance with those determined in the same test section by classical pressure probe methods. O.C.

A82-43757 # **Application of laser velocimetry to large industrial wind-tunnels.** A. Boutier and M. Canu (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *(International Symposium on Applications of Laser-Doppler Anemometry to Fluid Mechanics, Lisbon, Portugal, July 5-7, 1982.) ONERA, TP* no. 1982-63, 1982. 11 p. Research supported by the Direction des Recherches, Etudes et Techniques.

Laser velocimetry has been recently applied in two large industrial transonic wind-tunnels at Modane. In S3 Modane, a blow-down facility, a velocity map has been obtained around a model, with a two-dimensional laser velocimeter using forward scattered light and two XYZ benches, one on each side of the test section: the whole velocimeter was monitored by a mini computer during the runs. At S2 Modane, preliminary experiments have shown that a laser velocimeter can be operated in a pressurized chamber and can provide good results, if some precautions indicated in the paper are taken. (Author)

A82-43792 **Recent results in main beam nulling.** R. N. Adams, W. G. Brodsky, L. L. Horowitz, and K. D. Senne (MIT, Lexington, MA). In: ICC '81; International Conference on Communications, Denver, CO, June 14-18, 1981, Conference Record. Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 10.5.1-10.5.5. USAF-sponsored research.

The use of an adaptive, multibeam antenna, which nulls main-beam interferers while tracking and receiving the friendly signal, can significantly reduce the size of the link outage region which results when interferers pass through the main beam of a receiving antenna aboard an aircraft. A multibeam adaptive antenna system which responds to these technical requirements has been designed and partially fabricated. Details of the system design are reviewed, as are preliminary results of laboratory and antenna test range experiments. (Author)

A82-43821 **The aviation route forecast /ARF/ program - An interactive system for pilot self-briefing.** E. M. Gross, T. Laufer (NOAA, National Weather Service, Silver Spring, MD), and T. R. Mitchell (Mitre Corp., Bedford, MA), and F. J. Steckbeck (FAA, Washington, DC). In: ICC '81; International Conference on Communications, Denver, CO, June 14-18, 1981, Conference Record. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 32.1.1-32.1.9. 19 refs.

A more effective procedure of making weather information available to the user would lead to a significant improvement in weather services. A description is presented of the evolution of the Pilot Self-Briefing program and the Aviation Route Forecast (ARF) development effort. These two program efforts have been integrated so that users can directly acquire weather information tailored by the computer to their specific interests. As presently constituted, the ARF concept is oriented toward aviation, but the basic hardware, software, and algorithms could be adapted to other forecasting applications. Attention is given to the background regarding the pilot self-briefing development, the ARF concept and development, the ARF output processing rationale, the ARF output organization, pilot self-briefing data reduction due to ARF, past ARF testing, future ARF testing, and the need for forecaster analysis support systems. B.R.

A82-43840 **Electronic warfare system measure of effectiveness.** A. B. Glenn (Mitre Corp., McLean, VA). In: ICC '81; International Conference on Communications, Denver, CO, June 14-18, 1981, Conference Record. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 36.6.1-36.6.5.

A methodology is proposed to determine the measure of effectiveness (MOE) of systems used in electronic warfare (EW). This MOE will use a combination of both qualitative and quantitative measures which are based on the EW systems test data, the threat environment, and the necessary mathematical analysis. The MOE which is quantitative gives a more accurate indication of the EW effectiveness than the commonly used qualitative measures of high-medium-low. A simple example is given to illustrate how the MOE of an anti-jam (AJ) Ground Control Intercept (GCI) communications system can be determined for a specific hypothetical scenario. (Author)

A82-43870 **Combined amplitude-phase modulation for a VHF communication link.** G. Renelli, G. Borghi, V. Cappellini, E. Del Re, and S. Guidi (Firenze, Università, Florence, Italy). In: ICC '81; International Conference on Communications, Denver, CO, June 14-18, 1981, Conference Record. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 56.6.1-56.6.6. 6 refs.

In this work a combined amplitude-phase modulation communication system is considered. Amplitude modulation is used to transmit a voice signal, phase modulation is used for data transmission. Such a scheme was studied as a possible realization of a data channel between aircraft and ground stations. The performance of the combined modulation system is evaluated through computer simulation in the two cases AM-PSK and AM-MSK. (Author)

A82-43888 **A new class of routing protocols for a proposed computer network linking tactical radar sites.** C. Warner (U.S. Naval Ocean Systems Center, San Diego, CA) and J. Spragins (Clemson University, Clemson, SC). In: ICC '81; International Conference on Communications, Denver, CO, June 14-18, 1981, Conference Record. Volume 4. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 73.6.1-73.6.10. 6 refs.

An advanced forward area tactical radar network, which has been studied for the Air Force Electronic Systems Division, can be viewed as a novel form of computer network, sharing many of the problems of more standard computer networks but with other unique problems resulting from the specialized nature of the application. This network will link together a number of short range tactical radars, each with associated data processing equipment, spaced at nominal distances of approximately 30 miles, and enable each radar site to have a complete file of tracks for all targets seen by any radar in the network. In addition, the communication network is expected to be used for transmission of a variety of other types of command and control messages. As part of the design of this network, a new class of distributed and adaptive routing protocols has been developed. The results of simulation studies of these routing algorithms are presented. (Author)

A82-44051 # **Generation of boundary-conforming grids around wing-body configurations using transfinite interpolation.** L. E. Eriksson (Flygtekniska Forsoksanstalten, Bromma, Sweden). *AIAA Journal*, vol. 20, Oct. 1982, p. 1313-1320.

A computational procedure for generating three-dimensional nonorthogonal surface-fitted mesh systems around wing-fuselage configurations is presented. The method is based on the concept of transfinite interpolation, which has been extended to handle very general mapping function specifications at the boundaries, thereby making it possible to generate single-block mappings with geometry data specified only at the outer boundaries of the computational domain. Since it is a direct algebraic mapping technique, the method is very inexpensive in terms of computer cost. Different types of possible mappings are compared with respect to resolution and economy of nodal points. A procedure for a novel type of mapping, designated type O-O, is described and several plots of generated grids demonstrate the capabilities of the method. The singular lines inherent in every three-dimensional mesh for this type of surface geometry are also discussed. (Author)

A82-44052 # **Damped Euler-equation method to compute transonic flow around wing-body combinations.** A. Rizzi (Flygtekniska Forsoksanstalten, Bromma, Sweden). *AIAA Journal*, vol. 20, Oct. 1982, p. 1321-1328. 22 refs. Research sponsored by the Forsvarets Materielverk.

Inviscid transonic flows containing either strong shock waves or complex vortex structure call for the Euler equations as a realistic model. Presented here is a computational procedure for solving the Euler equations for transonic flow around a wing and fuselage upon an O-O mesh generated by transfinite interpolation. An explicit time-marching finite-volume procedure solves the flow equations and features a nonreflecting far field boundary condition, an internal mechanism for temporal damping, and use of the local time step, all of which improve the convergence of the computation. Converged after several hundred iterations, results computed on the CYBER 203 vector processor are compared with experimental data and potential-flow computations. The Euler-equation model is found to predict the existence of a tip vortex created by inviscid flow separation in the downstream region of the tip of the M6 wing where the radius of curvature approaches zero. (Author)

A82-44100 **A method to determine runway capacity.** M. Jelenko and T. Jovanovic (ZG-Prometni Institut, Ljubljana, Yugoslavia). *Airport Forum*, vol. 11, Aug. 1982, p. 42-46.

empennage surfaces. A nonlinear lifting surface analysis is utilized to predict the aerodynamic loads on the empennage surfaces in the presence of these concentrated vortices. The analysis was formulated to include all pertinent effects such as suction of the interacting vortices and the shed vorticity behind the empennage surfaces. The analysis employs a time domain solution. The output of the program consists of chordwise and spanwise airload distributions on the empennage surfaces. The airload distributions are harmonically analyzed and formulated for input into the Coupled Rotor/Airframe Vibration Analysis. Author

N82-31296*# United Technologies Research Center, East Hartford, Conn.
A PRESCRIBED WAKE ROTOR INFLOW AND FLOW FIELD PREDICTION ANALYSIS, USER'S MANUAL AND TECHNICAL APPROACH
T. A. Egolf and A. J. Landgrebe Jun. 1982 79 p refs
(Contract NAS1-16058)
(NASA-CR-165894; NAS 1.26:165894; UTRC81-2) Avail: NTIS HC A05/MF A01 CSCL 01A

A user's manual is provided which includes the technical approach for the Prescribed Wake Rotor Inflow and Flow Field Prediction Analysis. The analysis is used to provide the rotor wake induced velocities at the rotor blades for use in blade airloads and response analyses and to provide induced velocities at arbitrary field points such as at a tail surface. This analysis calculates the distribution of rotor wake induced velocities based on a prescribed wake model. Section operating conditions are prescribed from blade motion and controls determined by a separate blade response analysis. The analysis represents each blade by a segmented lifting line, and the rotor wake by discrete segmented trailing vortex filaments. Blade loading and circulation distributions are calculated based on blade element strip theory including the local induced velocity predicted by the numerical integration of the Biot-Savart Law applied to the vortex wake model. Author

N82-31297*# Sikorsky Aircraft, Stratford, Conn.
USER'S MANUAL FOR THE AUTOMATED PANELING TECHNIQUE (APT) AND THE WING BODY AERODYNAMIC TECHNIQUE (WABAT) PROGRAMS Final Report
R. E. Studwell Jun. 1982 44 p refs
(Contract NAS1-16058)
(NASA-CR-165895; NAS 1.26:165895) Avail: NTIS HC A03/MF A01 CSCL 01A

User instructions for the Tektronix Graphics Package of the Automated Paneling Technique (APT) and the Wing and Body Aerodynamic Technique (WABAT) Programs are provided. Responses to plot package messages which the user must make to activate plot package operations and options are described. Modifications to the APT and WABAT input run streams, to affect the graphic interface, are also covered. Author

N82-31298*# United Technologies Research Center, East Hartford, Conn.
AEROELASTIC ANALYSIS FOR HELICOPTER ROTORS WITH BLADE APPENDED PENDULUM VIBRATION ABSORBERS. MATHEMATICAL DERIVATIONS AND PROGRAM USER'S MANUAL Final Report
Richard L. Bielawa Jun. 1982 109 p refs
(Contract NAS1-16058)
(NASA-CR-165896; NAS 1.26:165896; UTRC81-45) Avail: NTIS HC A06/MF A01 CSCL 01A

Mathematical development is presented for the expanded capabilities of the United Technologies Research Center (UTRC) G400 Rotor Aeroelastic Analysis. This expanded analysis, G400PA, simulates the dynamics of teetered rotors, blade pendulum vibration absorbers and the higher harmonic excitations resulting from prescribed vibratory hub motions and higher harmonic blade pitch control. Formulations are also presented for calculating the rotor impedance matrix appropriate to these higher harmonic blade excitations. This impedance matrix and the associated vibratory hub loads are intended as the rotor blade characteristics elements for use in the Simplified Coupled Rotor/Fuselage Vibration Analysis (SIMVIB). Sections are included presenting updates to the development of the original G400 theory, and material appropriate to the user of the G400PA computer program. This material includes: (1) a general description of the structuring of the G400PA FORTRAN coding, (2) a detailed description of the required input data and other useful information for successfully running the program, and (3) a detailed description of the output results. Author

N82-31299*# Sikorsky Aircraft, Stratford, Conn.
USER'S MANUAL FOR THE COUPLED ROTOR/AIRFRAME VIBRATION ANALYSIS GRAPHIC PACKAGE Final Report
R. E. Studwell Jun. 1982 27 p
(Contract NAS1-16058)
(NASA-CR-165897; NAS 1.26:165897) Avail: NTIS HC A03/MF A01 CSCL 01A

User instructions for a graphics package for coupled rotor/airframe vibration analysis are presented. Responses to plot package messages which the user must make to activate plot package operations and options are described. Installation instructions required to set up the program on the CDC system are included. The plot package overlay structure and subroutines which have to be modified for the CDC system are also described. Operating instructions for CDC applications are included. S.L.

N82-31300*# Flow Research, Inc., Kent, Wash.
SINGULARITY EMBEDDING METHOD IN POTENTIAL FLOW CALCULATIONS
Wen-Huei Jou and Hung Huynh Jun. 1982 28 p refs
(NASA Order A-77471B)
(NASA-CR-166387; NAS 1.26:166387) Avail: NTIS HC A03/MF A01 CSCL 01A

The so-called H-type mesh is used in a finite-element (or finite-volume) calculation of the potential flow past an airfoil. Due to coordinate singularity at the leading edge, a special singular trial function is used for the elements neighboring the leading edge. The results using the special singular elements are compared to those using the regular elements. It is found that the unreasonable pressure distribution obtained by the latter is removed by the embedding of the singular element. Suggestions to extend the present method to transonic cases are given. Author

N82-31301*# Grumman Aerospace Corp., Bethpage, N.Y.
AXISYMMETRIC AND NON-AXISYMMETRIC EXHAUST JET INDUCED EFFECTS ON A V/STOL VEHICLE DESIGN. PART 2: ANALYSIS OF RESULTS
W. C. Schnell Jan. 1982 202 p refs
(Contract NAS2-9887)
(NASA-CR-166365; NAS 1.26:166365) Avail: NTIS HC A10/MF A01 CSCL 01A

A wind tunnel investigation, employing a 1/8 scale model in an 11 foot transonic wind tunnel (Mach 0.4-1.4), was conducted to determine the jet effects of several exhaust nozzles on the aeropropulsive performance of a V/STOL fighter design. The force and pressure data show that significant differences in aeropropulsion performance can be expected by varying the exhaust nozzle type, jet area and deflection angle on an underwing nacelle installation. At unvectored conditions, the single expansion ramp nozzles show large performance gains relative to a circular nozzle installation. Additionally, a further drag reduction is realized when the nonaxisymmetric nozzle is vectored through a 10 degree deflection angle. The combined payoff of the vectored nonaxisymmetric nozzle over the baseline circular nozzle installation is equivalent to 25 percent of zero lift drag. R.J.F.

N82-31302*# Grumman Aerospace Corp., Bethpage, N.Y.
AXISYMMETRIC AND NON-AXISYMMETRIC EXHAUST JET INDUCED EFFECTS ON A V/STOL VEHICLE DESIGN. PART 3: EXPERIMENTAL TECHNIQUE
W. C. Schnell Jun. 1982 115 p refs
(Contract NAS2-9887)
(NASA-CR-166147; NAS 1.26:166147) Avail: NTIS HC A06/MF A01 CSCL 01A

The jet induced effects of several exhaust nozzle configurations (axisymmetric, and vectoring/modulating variants) on the aeropropulsive performance of a twin engine V/STOL fighter design was determined. A 1/8 scale model was tested in an 11 ft. transonic tunnel at static conditions and over a range of Mach Numbers from 0.4 to 1.4. The experimental aspects of the static and wind-on programs are discussed. Jet effects test techniques in general, flow through balance calibrations and tare force corrections, ASME nozzle thrust and mass flow calibrations, test problems and solutions are emphasized. S.L.

N82-31303*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUPERCRITICAL MANEUVERING FIGHTER CONFIGURATION. WIND-TUNNEL INVESTIGATION AT MACH NUMBERS OF 0.60 TO 0.95

Michael J. Mann, Charles E. Mercer, and Richard L. Campbell
Sep. 1982 69 p refs
(NASA-TM-84513; L-15399; NAS 1.15:84513) Avail: NTIS HC A04/MF A01 CSCL 01A

A wind tunnel investigation was conducted to study the application of supercritical technology to highly maneuverable combat aircraft. The configuration studied has a leading-edge sweep of 45 deg and an aspect ratio of 3.28. Two supercritical-wing shapes were tested at Mach numbers from 0.60 to 0.95 with angles of attack from -2 deg to 17 deg. On supercritical wing was designed to achieve a high level of transonic maneuver performance at a Mach number of 0.90; however, excessive flow separation developed on this wing at a Mach number of 0.85. A second supercritical wing was tested which had significantly reduced flow separation and improved drag characteristics at a Mach number of 0.85 and maintained the performance of the original wing at the higher Mach numbers. Leading-edge vortex generators did not improve the performance of the second wing; however, a sharp leading-edge flap produced sizable drag reductions at Mach numbers from 0.60 to 0.90. Author

N82-31304*# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.

HYBRID STATE VECTOR METHODS FOR STRUCTURAL DYNAMIC AND AEROELASTIC BOUNDARY VALUE PROBLEMS

Larry Lee Lehman Washington NASA Aug. 1982 195 p refs
(Grant NGL-05-020-243)
(NASA-CR-3591; NAS 1.26:3591) Avail: NTIS HC A09/MF A01 CSCL 01A

A computational technique is developed that is suitable for performing preliminary design aeroelastic and structural dynamic analyses of large aspect ratio lifting surfaces. The method proves to be quite general and can be adapted to solving various two point boundary value problems. The solution method, which is applicable to both fixed and rotating wing configurations, is based upon a formulation of the structural equilibrium equations in terms of a hybrid state vector containing generalized force and displacement variables. A mixed variational formulation is presented that conveniently yields a useful form for these state vector differential equations. Solutions to these equations are obtained by employing an integrating matrix method. The application of an integrating matrix provides a discretization of the differential equations that only requires solutions of standard linear matrix systems. It is demonstrated that matrix partitioning can be used to reduce the order of the required solutions. Results are presented for several example problems in structural dynamics and aeroelasticity to verify the technique and to demonstrate its use. These problems examine various types of loading and boundary conditions and include aeroelastic analyses of lifting surfaces constructed from anisotropic composite materials. Author

N82-31305# Arizona Univ., Tucson. Engineering Experiment Station.

SURFACE GENERATION FOR AERODYNAMIC APPLICATIONS

H. Sobieczky (DFVLR, Goettingen, West Germany) Jun. 1981 22 p refs
(Contract N00014-78-C-0182)
(AD-A116263; TFD-81-03) Avail: NTIS HC A02/MF A01 CSCL 20/4

This paper describes an analytical procedure to obtain the geometry of wing-body combinations, missiles, rotors and propellers, to be used in computational algorithms as well as for automated tool manufacturing wind tunnel models for flow-field analysis, with emphasis on parametrical shape variations needed in aerodynamic design and optimization procedures. Analytical shape definition allows for arbitrary surface coordinates generation to be combined with three dimensional (flow space) grid generators. Present version of the code (E38-A) defines the wing along sections at constant span, with smooth deviations near the wing root section, which is projected onto the body surface. The body is defined by cross-section shapes based on superelliptic arcs, connecting analytic crown lines and planform projection curves. Wing sections are defined by an analytical blending between given root and central sections for the inner part of the wing, and the same between the central and tip section for the outer part of the wing. These three basic airfoils may be given as dense data from preceding two dimensional design or as relatively few spline supports for an interpolation technique of suitably stretched ordinates in order to density airfoil data. GRA

N82-31308# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.

MATERIALS AND DESIGN CRITERIA FOR KEVLAR-29 RIBBON PARACHUTES Final Report, 1 Sep. - 1 Mar. 1980

William R. Pinnell Apr. 1982 267 p refs
(AF Proj. 2402)
(AD-A116357; AFWAL-TR-81-3138) Avail: NTIS HC A12/MF A01 CSCL 01/3

This report contains information and design criteria for application of Kevlar-29 (intermediate modulus para-aramid) textile materials to ribbon parachutes. Textile materials for this application are listed, their properties and limitations discussed, and methods for tensile testing presented. Twenty degree conical continuous ribbon parachute test items were designed and fabricated using Kevlar-29 textile materials entirely. The results of air drop and sled track testing at subsonic and transonic conditions are presented and design criteria based on these results are reported. The effects of reefing (two stages) on aerodynamic performance of the 15.3 ft nominal diameter parachutes is also reported. The report treats joining techniques for kevlar-29 parachute components and presents the results of tensile tests of joint samples. Design considerations and fabrication techniques related to application of Kevlar-29 materials are included. A comprehensive list of references useful to the parachute or decelerator system designer is provided. Author (GRA)

N82-31309# Sandia Labs., Albuquerque, N. Mex.

REDUCTION IN PARACHUTE DRAG DUE TO FOREBODY WAKE EFFECTS

Carl W. Peterson and Donald W. Johnson 1981 10 p refs
Presented at the 7th AIAA Aerodyn. Decelerator and Balloon Technol. Conf., San Diego, Calif., 21 Oct. 1981
(Contract DE-AC04-76DP-00789)
(DE81-030124; SAND-81-0510C) Avail: NTIS HC A02/MF A01

The reduction in parachute drag due to forebody wake effects was predicted. The drag of a 20 deg conical ribbon parachute was measured at several axial stations behind an ogive cylinder forebody with and without fins. The same parachute was tested in undisturbed flow (where wake effects were negligible) so that the effects of suspension line length on parachute drag could be separated from the drag losses caused by the turbulent wake. Total head pressure surveys were made across the forebody wake and integrated across the canopy skirt area to determine the effective dynamic pressure acting on the parachute. Experimental results confirmed the validity of the underlying physical model of the parachute/wake interaction: the ratio of parachute drag behind a forebody divided by wake-free parachute drag is equal to the ratio of effective dynamic pressure acting on the parachute divided by freestream dynamic pressure. DOE

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Two approaches to the calculation of runway capacity are presented, and are compared by application to a specific situation. The analytic model provides point-by-point estimates of the capacity for given percentages of landings out of the total number of operations, but the relationship between capacity, input flow and average delays per aircraft cannot be determined. The simulation model, employing the Monte Carlo method, takes into consideration the input flows into the system, so average aircraft delays can be estimated and the relationship of the capacity to the values of the parameters can be determined. This makes the simulation model more suitable for the analysis of airport operation. A block diagram of the simulation model is included. A.B.

A82-44218 # **New approaches to fighter design.** *Dornier-Post* (English Edition), no. 3, 1982, p. 4-6.

The principles of the development of a cost-effective weapons system which could replace the Luftwaffe F-4 Phantom tactical combat aircraft are summarized. The first principle which Dornier has proposed is maximum fleet effectiveness, and the approach to this goal includes such considerations as determining the effects of aircraft, weapons, and equipment requirements on costs, evaluating the effects of requirements on combat effectiveness, and identifying cost-effective substitute performances. A second principle is that new technologies be developed which are based on cost-effectiveness criteria, rather than performance criteria. Criteria include the use of cost-effective carbon fiber materials, and plastic-formed and diffusion-bonded titanium components. The tailless all-wing aircraft is considered as an example of the integration of new technologies for new weapons systems capabilities. Operational analysis reveals that the dry thrust concept can match tactical fighters' combat performance, and, in some missions, offers a superiority of 50%. R.K.R.

A82-44219 # **New technologies for future fighters.** *Dornier-Post* (English Edition), no. 3, 1982, p. 7-10.

Recent activities underway at Dornier in the fields of aerodynamics and flight mechanics are presented. The Alpha Jet is being used to test a transonic wing (TST), which, compared to the standard wing, has an 18% thicker profile, advanced wing/fuselage blending, and maneuver flaps comprised of leading-edge slats and trailing-edge flaps. Tests have shown an improvement in drag-rise and buffeting limits, and the thicker wing permits carrying additional fuel without external tanks. The maximum lift coefficient has been increased by approximately 20%, allowing higher stationary and unstationary load factors, thus improved maneuverability. In addition, direct side force control (DSFC) tests, aimed at accelerating aircraft alignment, have shown that the system is good in all three axes, the drag control mode is effective with decelerations of up to 0.75 g in horizontal flight, and well-controlled steep dives at constant speed are possible. A combination of the TST and DSFC programs will be tested on a modified Alpha Jet. R.K.R.

A82-44220 # **Perspectives for the use of remotely piloted vehicles in military technology.** W. Klaar. *Dornier-Post* (English Edition), no. 3, 1982, p. 23-29.

An overview of remotely piloted vehicle (RPV) technology is presented in terms of crew replacement, design possibilities, and mission tasks. In air attack applications, one-way missile concepts are preferred, as they use airborne signal processing and need no remote pilot. Terrain contours have been used for en-route navigation, and more precise methods are being investigated. For mission planning, computer-based methods and systems must be used. In addition, unmanned carrier platforms and net recovery methods are being developed at Dornier. This recovery method reduces launch vehicle weight by 8-15%, and ensures well-controllable landing decelerations. Applications for unmanned systems include air target simulation, aerial reconnaissance, and electronic warfare tasks. R.K.R.

A82-44221 # **Image processing in tactical flight guidance.** *Dornier-Post* (English Edition), no. 3, 1982, p. 32-36.

Work performed by Dornier in the field of image processing in tactical flight guidance is presented. Image-forming sensors scan the scene and store the energy potential to form a TV image, and sensors are being designed for the infrared range and the millimeter wave range. To remove errors and imperfections from the image, preprocessing methods such as a two-dimensional high pass filter, a histogram for contrast spreading, and inverse filtering methods are used. An object recognition process is explained which involves a comparison between stored images and recently scanned area images. Pattern and feature recognition can be achieved by two approaches. The first is a direct image comparison (image point brightness value), and the second consists of transforming two images into a single feature space for comparison. Images which represent these processes are included. R.K.R.

A82-44222 # **Automated flight data processing.** K. Blumenwitz. *Dornier-Post* (English Edition), no. 3, 1982, p. 39-43.

The automated flight data processing (AFA) system for use in the Alpha Jet consists of six components which are (1) a digital computer with two disk drives, (2) an electronic cabinet with central voltage cutoff, (3) a single-color screen (38 cm x 28 cm), (4) a screen copier which supplies an A4 hardcopy of the screen display, (5) a printer with keyboard, and (6) an elevated and inclining map table. Stored meteorological data can be updated for a planned mission, and once they are verified, a low-level or a high-level mission, or any combination of the two, can begin. Due to time savings in low- and high-level flight planning, the pilot has more time to study the planned flight path and the available flight information. It is mentioned that the AFA has been designed such that it is adaptable to the requirements of other flying weapons systems. R.K.R.

A82-44223 # **Interactive graphics design with CODEM.** L. Thieme. *Dornier-Post* (English Edition), no. 3, 1982, p. 49-52.

The Computer-Graphics Augmented Design and Manufacturing System (CODEM) is user-optimized and can be connected to other program systems. CODEM offers a time savings in making precise drawings, resulting in a cost savings and a shorter project cycle time. Aspects to consider when the system is introduced include user participation during preparations, computer configuration planning which avoids lengthy response times, and well planned file organization and data security. In addition, it is found that a six-hour work day for each designer is required, and such tasks as short discussions and consulting, calculations, and looking up of standard components can be performed at the display. In order to ensure uninterrupted and transparent data transfer in the design, development, and production of the aircraft, link-ups with other program systems are made via the defined interfaces of CODEM. R.K.R.

A82-44224 # **The design of airfoil profiles with trailing edge loading in transonic flow (Conception de profils à charge arriere en écoulement transsonique).** E. Lavigne. *Toulouse, Conservatoire National des Arts et Métiers, Ingénieur en Aérodynamique Thesis, 1981. 112 p. In French. Research supported by the Service Technique des Programmes Aéronautiques.*

The results and techniques of a series of studies to define airfoil profiles with satisfactory characteristics in transonic flows are presented. An inverse numerical model for transonic flows past an airfoil is developed, along with techniques for a two-dimensional analysis of transonic flows coupled to a boundary layer. The results of trials performed in wind tunnels with perforated walls to diminish the intensity of reflected waves are presented, along with a description of the instrumentation, including 76 pressure sensors, photographic equipment, and carborundum bands to induce transition to separation. Results are presented for configurations producing higher maximum lift, augmented buffeting lift, and reducing drag. It is shown that increasing the trailing edge loading increases drag. M.S.K.

A82-44231 # **Radionavigation for civil aviation (La radionavigation de l'aviation civile).** O. Carel (Direction Générale à l'Aviation Civile, Paris, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811760.* 17 p. In French.

Radionavigation systems involving beacons either on the ground or on satellites which transmit and receive signals from general aviation aircraft for fixing location and distance are reviewed. The systems are intended to allow flight in the shortest possible route, to aid in avoiding ground obstacles, to keep flight within controlled airspace and aid in avoiding air collisions, and to aid landing in safe and timely conditions. In France, ground based beacons comprise 160 radiocompasses, 30 VHF goniometers, 70 VOR installations, 80 ILS stations, 30 DME units, and the ILS successor, the MLS. Additionally, the Navstar global positioning system will eventually feature 18 satellites to give continuous worldwide coverage. The use of frequency synthesizers to allow high volume multiple access to DME units is noted, along with widespread use of the MLS to replace ILS beacons. Finally, the increasing radio noise from citizen band radios, television, and industry as a threat to VHF radionavigation systems' effectiveness is mentioned. M.S.K.

A82-44232 # **The ILS in Category III operations (L'ILS dans les opérations de Catégorie III).** J. P. Dupont (Direction Générale à l'Aviation Civile, Service Technique de la Navigation Aérienne, Paris, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26,t27, 1981, Paper 811761.* 19 p. In French.

The evolution of ground-based equipment for support of an inertial landing system (ILS) for the French national air routes is described, along with nominal functioning characteristics. The approach trajectory is defined by a track represented by a three degree angle from the ground which includes the point of touchdown. The ILS consists of two signals giving angular references within a limited volume. The signals register on the same display grid for the pilot, while the autopilot performs functions of maintaining center of gravity and aligning the aircraft in its approach, taking into account both lateral and longitudinal motions. Specific features of monitoring the radio beacons to assure accuracy are outlined, and attention is given to the certification process. All weather landing is made feasible by use of the ILS, even in conditions of extremely low ceiling. M.S.K.

A82-44233 # The flight management computer (Calculateurs de gestion du vol). J. Grossin (Société Nationale Industrielle Aérospatiale, Direction des Etudes, Toulouse, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811762.* 23 p. In French.

Numerical models and their implementation into flight management computers to ensure maximum flight economies in the air transport industry are discussed. The FMC system comprises a data bank, a memory-filed flight plan, built-in programs for determining the position of the aircraft and optimizing the performance, a display system for alerting the pilot to autopilot actions or recommending actions, and a series of sensors to monitor the aircraft interior, the environment, and waypoints on the flight path. Optimization is shown to reside in minimizing both fuel consumption and the flight time. The flight is divided into three phases in the computer: ascent, cruise, and descent, with calculations proceeding through use of a singular perturbation algorithm. The necessity of the computer being able to receive and process data in-flight is stressed, and the implementation of bubble chips and magnetic disks is noted. M.S.K.

A82-44234 # Electronic aircraft stabilization (Stabilisation d'un avion par l'électronique). A. Chadeau (Ministère de la Defense, Service Technique des Télécommunications et des Equipements Aéronautiques, Paris, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811763.* 13 p. In French.

The performance, components, circuitry, and degree of totality of electronic autopilots are discussed. The systems are noted to alleviate the pilot work load in cruise flight and bad weather conditions as well as correcting instabilities which are beyond human capability and freeing the pilot for other tasks, such as managing armaments. Electronic autopilots have been shown to be capable of maintaining trim in pitch and roll, stabilizing the flight slope, course, altitude, speed, the course as determined by fixed radio beacons, landing an aircraft, and in controlling flare. A block diagram is furnished of an electrohydraulic servocontrol system, and the limits of on board computers to calculate responses to changing demands are discussed, along with safety procedures. Finally, programmed features for limiting and assessing the gravity and probability of malfunctions are outlined. M.S.K.

A82-44235 # Air-air anticollision systems (Systèmes d'anticollision air-air). A. Michel (Direction Générale à l'Aviation Civile, Service Technique de la Navigation Aérienne, Paris, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811764.* 47 p. In French.

The requirements for a successful air-air on-board anticollision system for aircraft are reviewed and test results to date on prototype equipment are discussed. The systems are noted to require the capability of detecting all possible collision dangers, must function at all times, offer clear avoidance paths, be compatible with air traffic control and other anticollision systems, function in controlled and uncontrolled airspace, have a low rate of false alarms, and be able to take into account multiple dangers in dense air traffic. Attention is given to BCAS (beacon collision avoidance system), a system equipped with a secondary radar set to detect the presence of other aircraft, measure the separation distance and altitude, discern those aircraft which pose a threat, and calculate an avoidance path. The safety maneuver can be done in coordination with the other aircraft's system if compatibility is present between the on-board systems. Block diagrams are furnished of a test system of the BCAS, along with an analysis of operational procedures. M.S.K.

A82-44236 # New image generators for the next generation of civil aircraft (Nouvelles visualisations pour la prochaine génération d'avions civils). M. Bernard and D. Giroux (Thomson-CSF, Division Equipements Avioniques, Malakoff, Hauts-de-Seine, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811767.* 21 p. In French.

The results of studies of problems, benefits, and applications, and design of CRT displays for private aircraft are discussed. Particular attention is given to avionics for the Airbus A 310 and the A 300-600 aircraft, and the possibilities of enhancing the reliability of pilot data displays while reducing the volume necessary for cockpit instrumentation. The CRTs will produce color images, and in being coupled to the central computer, will permit the pilots to call up a wide range of data on any screen with the mode of display adapted for each stage of a flight. The displays will follow the flight path and provide changing parameters during takeoff and during automatic adaptation during velocity changes to maintain efficient flight under changing mass due to fuel being consumed. M.S.K.

A82-44238 # New trends and concerns in the airliner radio equipment market (Nouvelles tendances et nouvelles préoccupations sur le marché des équipements radio avions de ligne). H. Medioni (Electronique Aérospatiale, Le Bourget, Seine-Saint-Denis, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811768.* 10 p. In French.

The types of new electronics for avionics communication and navigation displays which are currently available to airlines, and problems inherent in assuring that microprocessors installed on fleet aircraft are not made obsolescent in too short a time are discussed. Airline regulations in France which require the interchangeability of certain electronic equipment in order to assure, at least in the respect, the financial viability of making repairs to electronic equipment in a safe manner with a short down time are noted. One requirement for equipment such as multiplexers, multiemitters/multireceivers, and locators has been in operation at 1 Mbit/sec, while monoemitters in open switch position transmit at 12 kbit/sec. Problems which are expected to occur in flight-qualifying totally automated pilot systems, including landing systems, are explored. M.S.K.

A82-44239 # Satellite localization of aircraft accidents - The Sarsat program (La localisation par satellite des accidents d'avion - Le programme SARSAT). M. Leveque (Centre National d'Etudes Spatiales, Direction des Programmes et de la Planification, Paris, France). *Société des Electriciens, des Electroniciens et des Radioélectriciens, Journée d'Etudes sur l'Electronique dans l'Aéronautique, Nice, France, Nov. 26, 27, 1981, Paper 811765.* 24 p. In French.

Features of the search and rescue satellite aided tracking (Sarsat) system, which will aid in locating air and seacraft in distress conditions, are outlined. The first Sarsat will be launched in 1982 and a globally operating system is envisioned by 1990. The program, a joint effort by the U.S. and Canada beginning in 1976, was joined by the French in 1977 for coordination with the Sargos program, and by the Soviet Union for the Cospas program. Doppler location by Sarsat will comprise beacons operating between 121.5-243 MHz for demonstration purposes, and then use beacons at 406 MHz in cooperation with the Sargos system. Repeaters are used if a distress signal in the 121.5-243 MHz band is received by an NOAA spacecraft equipped with SAR. The distress signal is stored on board and transmitted by downlink to a ground station when the satellite recrosses the continental U.S. or Canada. M.S.K.

A82-44244 # Pneumatic tire model for aircraft simulations. J. R. Kilner (Boeing Military Airplane Co., Seattle, WA). *Journal of Aircraft*, vol. 19, Oct. 1982, p. 851-857. 5 refs. Research supported by the Boeing Military Airplane Co.

The development of a tire model for the prediction of vertical and drag loads in response to large discrete surface obstacles shorter than the tire footprint length is presented. The tire is modeled as a toroidal membrane with the objective of characterizing the enveloping properties of the tire. An explicit set of equations is used to calculate the tire footprint in contact with a user specified surface profile, the tire volume, the pneumatic pressure, and the resultant vertical and drag loads at the wheel axle. Tire carcass and bottoming loads are also predicted. The model is designed to be computationally efficient for use with aircraft digital taxi simulations. Model predictions are compared with tire test data for low-speed fixed axle excursions over short rectangular bumps and dips. Excellent quantitative correlation is demonstrated. (Author)

A82-44245 # Transonic flutter and response analyses of two 3-degree-of-freedom airfoils. T. Y. Yang (Purdue University, West Lafayette, IN) and C. H. Chen. *Journal of Aircraft*, vol. 19, Oct. 1982, p. 875-884. 33 refs. Grant No. AF-AFOSR-78-3523.

Time-response and flutter analyses are presented for a conventional and a supercritical airfoil which are oscillating with plunge, pitch and aileron pitch degrees-of-freedom (DOFs) in small disturbance transonic flow, using the LTRAN2-NLR transonic code to calculate aerodynamic characteristics. The flutter speeds associated with the bending-torsion branch of aeroelastic parameters are plotted against Mach number for different parameter values, and the transonic dip phenomenon is demonstrated. The flutter modes are studied by plotting the flutter speed, amplitude ratio, and phase difference at various Mach numbers against the mass ratio for both a 2DOF and a 3DOF case. Time-response results are given for the conventional and supercritical airfoils at Mach 0.85 and 0.765, respectively. O.C.

A82-44246 * # Higher-order flow angle corrections for three-dimensional wind tunnel wall interference. M. H. Rizk (Flow Research Co., Kent, WA). *Journal of Aircraft*, vol. 19, Oct. 1982, p. 893-895. 5 refs. Contract No. NAS1-16262.

A second-order theory including camber effects in wind tunnel wall interference corrections is described. Changes in the geometrical configuration of the model tested are avoided by introducing the camber correction as an equivalent angle-of-attack correction. Tabular and graphic data are presented which indicate improved accuracy for second-order over first-order theory. O.C.

A82-44291 Improving aircarrier water survival. C. T. Lindemann, Jr. (Air Line Pilots Association International, Washington, DC). *SAFE Journal*, vol. 12, Fall 1982, p. 11-13.

Existing deficiencies in planning, preparation and equipment for aircraft water accident survival are reviewed and recommendations made. Many approved seat cushions are not adequate flotation devices for passengers, because the required level of buoyancy is lost after a few minutes of use, and because users have

N82-31311*# Virginia Univ., Charlottesville. Dept. of Mechanical Engineering.
IDENTIFICATION OF TERMS TO DEFINE UNCONSTRAINED AIR TRANSPORTATION DEMANDS Final Report, 26 Mar. 1980 - 31 Aug. 1981
Ira D. Jacobson and A. Robert Kuhlthau Apr. 1982 60 p refs
(Contract NAS1-14908)
(NASA-CR-165961; NAS 1.26:165961; UVA/528194/MAE-CE82/101) Avail: NTIS HC A04/MF A01 CSCL 01C

The factors involved in the evaluation of unconstrained air transportation systems were carefully analyzed. By definition an unconstrained system is taken to be one in which the design can employ innovative and advanced concepts no longer limited by present environmental, social, political or regulatory settings. Four principal evaluation criteria are involved: (1) service utilization, based on the operating performance characteristics as viewed by potential patrons; (2) community impacts, reflecting decisions based on the perceived impacts of the system; (3) technological feasibility, estimating what is required to reduce the system to practice; and (4) financial feasibility, predicting the ability of the concepts to attract financial support. For each of these criteria, a set of terms or descriptors was identified, which should be used in the evaluation to render it complete. It is also demonstrated that these descriptors have the following properties: (a) their interpretation may be made by different groups of evaluators; (b) their interpretations and the way they are used may depend on the stage of development of the system in which they are used; (c) in formulating the problem, all descriptors should be addressed independent of the evaluation technique selected. Author

N82-31313# Federal Aviation Administration, Washington, D.C.
SUMMARY OF FEDERAL AVIATION ADMINISTRATION RESPONSE TO NATIONAL TRANSPORTATION SAFETY BOARD SAFETY RECOMMENDATIONS Quarterly Report, Jul. - Sep. 1981
R. E. Livingston and C. A. Carpenter Oct. 1981 320 p refs
(AD-A115485; DOT/FAA/ASF-81/5) Avail: NTIS HC A14/MF A01 CSCL 05/4

This report contains NTSB recommendations and all FAA responses to Board recommendations that were delivered to the Board during the applicable quarter. In addition, the report includes NTSB requests and FAA responses concerning reconsiderations, status reports, and followup actions. The Table of Contents for this report reflects only those NTSB recommendations which are still open pending FAA action (i.e., those that have not been designated as 'Closed' by the NTSB as a result of acceptable action). Accordingly, the Table of Contents may reflect a number of multiple recommendations (example: A-81-36 through 38), but background material is included only for those recommendations which remain in an 'Open' status. Background information for those recommendations which have been closed is available in FAA Headquarters files. Author (GRA)

N82-31314# Federal Aviation Administration, Washington, D.C. Office of Aviation Safety.
SUMMARY OF FEDERAL AVIATION ADMINISTRATION RESPONSE TO NATIONAL TRANSPORTATION SAFETY BOARD SAFETY RECOMMENDATIONS Quarterly Report, Oct. - Dec. 1981
R. E. Livingston and C. A. Carpenter Jan. 1982 412 p refs
(AD-A115486; DOT/FAA/ASF-81/6) Avail: NTIS HC A18/MF A01 CSCL 05/04

This report contains NTSB recommendations and all FAA responses to Board recommendations that were delivered to the Board during the applicable quarter. In addition, the report includes NTSB requests and FAA responses concerning reconsiderations, status reports, and followup actions. The Table of Contents for this report reflects only those NTSB recommendations which are still open pending FAA action (i.e., those that have not been designated as 'Closed' by the NTSB as a result of acceptable action). Accordingly, the Table of Contents may reflect a number of multiple recommendations (example: A-81-88 through 91), but background material is included only for those recommendations which remain in an 'Open' status. Background information for those recommendations which have been closed is available in FAA Headquarters files. Author (GRA)

N82-31315# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
FAA ACCEPTANCE TESTS ON THE NAVIGATION SYSTEM USING TIME GLOBAL POSITIONING SYSTEM Z SET RECEIVER Final Report, Jun. - Dec. 1979
Robert J. Esposito Jul. 1982 21 p refs
(FAA Proj. 049-330-110)
(DOT/FAA/RD-82/9) Avail: NTIS HC A02/MF A01

Acceptance tests on the Navigation System Using Time and Ranging (NAVSTAR) Global Positioning System (GPS) Z-set receiver are described. The Yuma laser tracking system computed a reference trajectory against which the GPS receiver solution was compared. Data from five flights, totaling over 6 hours, are presented with the objective of assessing Z-set capabilities to meet civil aviation requirements for nonprecision approaches. Author

N82-31318# Mitre Corp., McLean, Va. Metrek Div.
OPERATIONAL AND FUNCTIONAL REQUIREMENTS FOR THE NAVIGATION SYSTEM IN TERMINAL AREAS Final Report
Satish C. Mohleji Feb. 1982 63 p refs
(Contract DOTA01-82-C-10003)
(AD-A116127; MTR-82W13; FAA-RD-82-10) Avail: NTIS HC A04/MF A01 CSCL 17/7

A comprehensive set of operational requirements relating the capabilities of the navigation system and its use in the ATC environment are developed in this paper by modifying the operational requirements for MLS established by the International Civil Aviation Organization. In order to establish the functional requirements, an interrelationship is established between the navigation system parameters, route geometry and ATC procedures considering system uncertainties. An impact of each ATC uncertainty (navigation, surveillance, communication delays, airspeeds and winds) is first examined individually by computing the time dispersions between the planned vs. the achieved aircraft performance. Then a total dispersion and control interaction is established by calculating the time variability due to speed adjustments permitted under ATC procedures, and by statistically combining the impact of the ATC uncertainties using a root sum square (RSS) approach. This technique is general enough to permit evaluation of functional requirements (accuracy, coverage and channel capacity) of any navigation system under varying ATC parameters, procedures and operational requirements. GRA

N82-31319# Mitre Corp., McLean, Va. Metrek Div.
ANALYSIS OF ACTIVE BCAS ALERT RATES AND PROTECTION BASED ON ACTUAL AIRCRAFT TRACKS Final Report
Lillian B. Zarrelli Feb. 1982 239 p refs
(Contract DTFA01-82-C-10003)
(AD-A116402; MTR-80W267; FAA-RD-82-33) Avail: NTIS HC A11/MF A01 CSCL 17/7

This document describes an evaluation of the performance of the Active Beacon Collision Avoidance System (Active BCAS) using the Houston data base and simulated midair collision scenarios. The Houston data was extracted from ARTS III tapes and consisted of 65 hours of operation. This data was used to measure alert rates and assess desensitization techniques aimed at reducing the number of unnecessary alerts. The midair data base consisted of the reconstructed flight paths of 15 actual midair collisions. Measures of protection and tradeoffs were made based on the performance of the BCAS logic in resolving these simulated collision scenarios. Author (GRA)

N82-31321*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EXPERIMENTAL INVESTIGATION OF ACTIVE LOADS CONTROL FOR AIRCRAFT LANDING GEAR
John R. McGehee and Robert C. Dreher Aug. 1982 72 p refs

(NASA-TP-2042; L-15224; NAS 1.60:2042) Avail: NTIS HC A04/MF A01 CSCL 01C

Aircraft dynamic loads and vibrations resulting from landing impact and from runway and taxiway unevenness are recognized as significant in causing fatigue damage, dynamic stress on the airframe, crew and passenger discomfort, and reduction of the pilot's ability to control the aircraft during ground operations. One potential method for improving operational characteristics of aircraft on the ground is the application of active control technology to the landing gears to reduce ground loads applied to the airframe. An experimental investigation was conducted which simulated the landing dynamics of a light airplane to determine the feasibility and potential of a series hydraulic active control main landing gear. The experiments involved a passive gear and an active control gear. Results of this investigation show that a series hydraulically controlled gear is feasible and that such a gear is very effective in reducing the loads transmitted by the gear to the airframe during ground operations. Author

N82-31322# Arizona Univ., Tucson. Engineering Experiment Station.

AN EFFECTIVE ALGORITHM FOR SHOCK-FREE WING DESIGN

K.-Y. Fung, A. Robert Seebass, L. J. Dickson, and C. F. Pearson Jun. 1981 31 p refs Presented at the 14th AIAA Fluid and Plasma Dyn. Conf., Palo Alto, Calif., 23-25 Jun. 1981

(Contract N00014-76-C-0182)

(AD-A116265; TFD-81-06) Avail: NTIS HC A03/MF A01 CSCL 20/4

This paper reviews the fictitious gas procedure of Sobieczky for finding shockfree airfoils and wings. Results for inviscid and viscous flows for airfoils and wings are described. The method is applied to a business jet planform resulting in a wing that should have good low speed characteristics as well as an M-infinity L/D that is near the maximum achievable for the wing lift and thickness chosen for the study. GRA

N82-31323# Atmospheric Sciences Lab., White Sands Missile Range, N. Mex. Atmospheric Sciences Lab.

THE MANEUVERABLE ATMOSPHERIC PROBE (MAP), A REMOTELY PILOTED VEHICLE Final Report

Roberto Rubio, Claude L. Tate, Maynard L. Hill, Harold N. Ballard, Mike Izquierdo, and Carlos McDonald May 1982 56 p refs

(DA Proj. 1L1-62111-AH-71)

(AD-A116118; ERADCOM/ASL-TR-0110) Avail: NTIS HC A04/MF A01 CSCL 01/3

This report documents, in considerable detail, the physical and aerodynamic characteristics of the 10-hp, 36.5-kg, radio-controlled MAP aircraft, as well as the novel fluidic and electrostatic vertical stabilizer systems assisting in aircraft control. The atmospheric and aerodynamic sensor configurations, including the sensor data telemetry system, are described. Three distinct flight experiments were conducted with the instrumented MAP vehicle. During the first experiment, dust particulate samples, raging in size from 0.2 micrometer to 400 micrometer, were obtained by flying the RPV-mounted samplers through low altitude dust clouds generated by ground-based 105-mm artillery shell explosions. Data from this experiment are presented. The second experiment involved characterizing typical atmospheric conditions along a laser propagation range (path). Graphs of atmospheric temperature, pressure, RH, and derived air density, all as functions of RPV altitude, present data that are representative of those obtained from the second experiment. Measurement accuracies for temperature, pressure, and RH are respectively shown to be plus or minus 1 deg C, plus or minus 2 percent of the total pressure and plus or minus 4 percent of actual RH. The third experiment was conducted with the instrumented RPV being flown near a mountain peak whose altitude is 2440 millimeter relative to mean sea level (msl). Atmospheric electric field intensity and turbulence structure measurements as functions of RPV position relative to the mountain peak make up the third set of data presented in this report. GRA

N82-31324# Army Natick Research and Development Command, Mass.

SIMULATION OF THE INTERACTION BETWEEN AIRDROP PLATFORMS AND AIRCRAFT ROLLERS

Earl C. Steeves Apr. 1982 54 p

(DA Proj. 1L1-62210-D-283)

(AD-A116370; NATICK/TR-82/014) Avail: NTIS HC A04/MF A01 CSCL 01/2

All airdrop loads must be certified as not exceeding the maximum aircraft roller loads. This certification is presently accomplished by a series of tests which are numerous and complex. This report looks at the possibility of replacing this test procedure with a numerical simulation. Two simulations are examined; a straightforward deterministic structural simulation and a structural simulation that includes the imperfections in the system in a statistical manner. The imperfections in the system are large enough to make the deterministic structural model inadequate, and insufficient data are available to make an accurate statistical model of the imperfections. As a result, it was not possible to develop a complete model to carry out the roller load simulation, although only the imperfection model is needed for completion of the statistical simulation. The statistical model was used to demonstrate that the use of very flexible rollers would reduce the importance of the imperfections in the system. GRA

N82-31325# Naval Air Propulsion Test Center, Trenton, N.J. Propulsion Technology and Project Engineering Dept.

A METHOD FOR DESIGNING INLET DISTORTION SCREENS FOR AIRCRAFT GAS TURBINE ENGINE TESTS USING AN INTERACTIVE COMPUTER PROGRAM Final Report

Robert E. Anderson May 1982 35 p ref

(AD-A116584; NAPC-PE-66) Avail: NTIS HC A03/MF A01 CSCL 21/5

The design of inlet distortion screens used for testing aircraft gas turbine engines can be facilitated by using an interactive computer program. This report describes a computer program which has been developed by the Naval Air Propulsion Center to aid in the screen design process. The computer program can be used to establish the initial screen design and to develop modifications after the screen is tested. Author (GRA)

N82-31326*# Analytical Mechanics Associates, Inc., Mountain View, Calif.

FUNCTIONAL DESIGN TO SUPPORT CDTI/DABS FLIGHT EXPERIMENTS Final Report

Tsuyoshi Goka Jul. 1982 170 p refs

(Contract NAS1-16802)

(NASA-CR-165947; NAS 1.26:165947) Avail: NTIS HC A08/MF A01 CSCL 01D

The objectives of this project are to: (1) provide a generalized functional design of CDTI avionics using the FAA developed DABS/ATARS ground system as the 'traffic sensor', (2) specify software modifications and/or additions to the existing DABS/ATARS ground system to support CDTI avionics, (3) assess the existing avionics of a NASA research aircraft in terms of CDTI applications, and (4) apply the generalized functional design to provide research flight experiment capability. DABS Data Link Formats are first specified for CDTI flight experiments. The set of CDTI/DABS Format specifications becomes a vehicle to coordinate the CDTI avionics and ground system designs, and hence, to develop overall system requirements. The report is the first iteration of a system design and development effort to support eventual CDTI flight test experiments. Author

N82-31327# Smiths Industries, Inc., Clearwater, Fla.

FINAL ENGINEERING REPORT FOR COMPUTER, WEAPON AIMING CP-1444/A Final Report

M. D. Caramichael 1 Jun. 1982 175 p refs

(Contract N00019-77-A-0350)

(AD-A115238; SI-0519) Avail: NTIS HC A08/MF A01 CSCL 19/5

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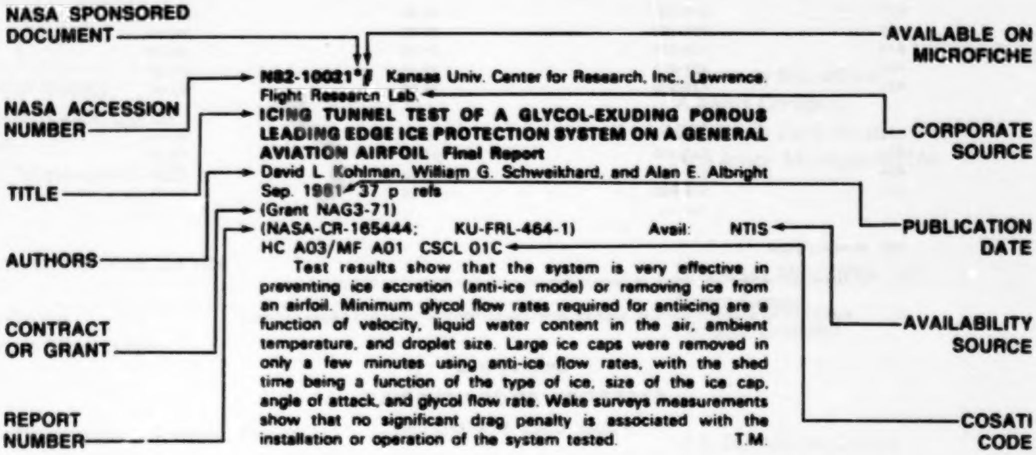

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N82-10021*# Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
ICING TUNNEL TEST OF A GLYCOL-EXUDING POROUS LEADING EDGE ICE PROTECTION SYSTEM ON A GENERAL AVIATION AIRFOIL Final Report
David L. Kohlman, William G. Schweikhard, and Alan E. Albright
Sep. 1981 37 p refs
(Grant NAG3-71)
(NASA-CR-165444; KU-FRL-464-1) Avail: NTIS HC A03/MF A01 CSCL 01C

Test results show that the system is very effective in preventing ice accretion (anti-ice mode) or removing ice from an airfoil. Minimum glycol flow rates required for antiicing are a function of velocity, liquid water content in the air, ambient temperature, and droplet size. Large ice caps were removed in only a few minutes using anti-ice flow rates, with the shed time being a function of the type of ice, size of the ice cap, angle of attack, and glycol flow rate. Wake surveys measurements show that no significant drag penalty is associated with the installation or operation of the system tested. T.M.

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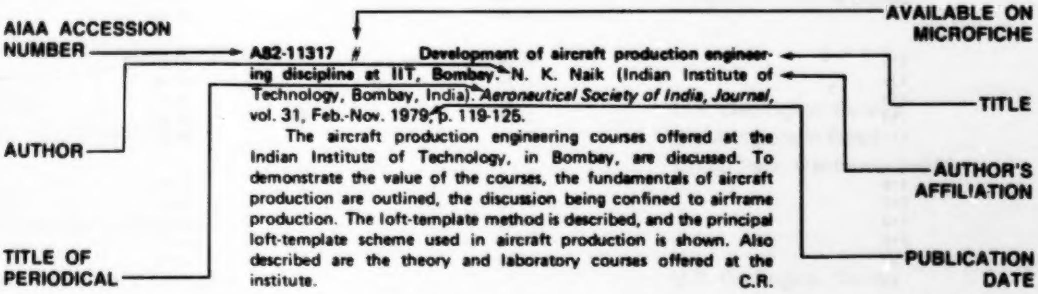

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A82-11317 # **Development of aircraft production engineering discipline at IIT, Bombay.** N. K. Naik (Indian Institute of Technology, Bombay, India). *Aeronautical Society of India, Journal*, vol. 31, Feb.-Nov. 1979, p. 119-125.

The aircraft production engineering courses offered at the Indian Institute of Technology, in Bombay, are discussed. To demonstrate the value of the courses, the fundamentals of aircraft production are outlined, the discussion being confined to airframe production. The loft-template method is described, and the principal loft-template scheme used in aircraft production is shown. Also described are the theory and laboratory courses offered at the institute. C.R.

AERONAUTICAL ENGINEERING *A Continuing Bibliography (Suppl. 155)*

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IAA ENTRIES

A82-41686 # The analysis of the thermal-mechanical stress conditions in axisymmetric rotating hot components of /aircraft/ gas turbines (Zur Analyse des thermisch-mechanischen Spannungszustandes in rotationssymmetrischen drehenden Heissteilen von /Flug-/ Gasturbinen). D. Keppeler. München, Technische Universität, Fakultät für Maschinenwesen, Dr.-Ing. Dissertation, 1980. 183 p. 85 refs. In German.

The essential equations for computations concerning axial turbine disks are presented, taking into account steady and unsteady heat transfer, linear-elastic calculations, elastoplastic calculations, and thermal, aerodynamic, and mechanical boundary conditions. Two different numerical methods are described. One is used to obtain numerical values regarding the aerodynamic-thermal boundary conditions at the hub and on the surfaces. The second procedure considered is the method of finite elements. This method provides a good approximation regarding the solution of the considered problems even in the case of axial turbine disks of complex shape. The suitability of the developed programs for the solution of the considered problems is demonstrated with the aid of comprehensive computational examples. The elastoplastic calculation discussed represents a first important step towards the computation of the operational life of hot gas turbine components which are subjected to great thermal-mechanical stresses. G.R.

A82-41687 # A restrained model helicopter, which is able to fly, for investigations regarding human multiparameter control behavior (Ein flugfähig eingespannter Modellhubschrauber für Untersuchungen zum menschlichen Mehrgröessenreglerverhalten). W. H. Oesterlin. Darmstadt, Technische Hochschule, Fachbereich Regelungs- und Datentechnik, Dr.-Ing. Dissertation, 1980. 259 p. 77 refs. In German. Research supported by the Deutsche Forschungsgemeinschaften.

The control of a Remotely Piloted Vehicle (RPV) with six degrees of freedom of motion represents for the human operator a very difficult problem. The present investigation is concerned with this problem. The conducted studies involve the control of the hovering flight of a remotely piloted model helicopter. A 'model helicopter trainer' was employed in place of a model engaged in free flight. By means of a special mechanism, the helicopter is connected to a carriage which is mounted on two rails. The constructional design involved permits helicopter hovering flight operations. The conduction of investigations regarding the control behavior of man requires that the dynamic behavior of the controlled system is known. A model for the operational characteristics of the helicopter in hovering flight was, therefore, developed. The model provided the basis for the development of a dynamic multiparameter control model for two experienced pilots. G.R.

A82-41700 Characteristics of a Paris-New York flight on board the Concorde (Réalisation d'un vol Paris-New York sur Concorde). F. Vicens (Compagnie Nationale Air France, Paris, France). *Navigation* (Paris), vol. 30, July 1982, p. 310-328. In French.

A summary of crew operating procedures in-flight on board the Concorde during a trip from Paris to New York is presented. Details of checklist sequences are reviewed, including adjustment of the center of gravity through fuel pumping, noise suppression steps, climb through the transonic regime, and use of afterburners for supersonic cruise. The inertial navigation system is activated once cruise speed is reached at Mach 2 and over 50,000 ft altitude, and maintains control for the Atlantic crossing. The landing phase is guided either by a VOR/DME designated Hyannis-Long Island, or by means of a VOR situated 119 nmi along a 142 deg radial vector from New York. Using the second beacon is noted to allow approximately six more miles in a supersonic regime. M.S.K.

A82-41725 Oxidation-resistant materials for hot-gas turbines and jet engines. I (Über oxidationsbeständige Werkstoffe für Heissgasturbinen und Strahltriebwerke. I). K. Hauffe. *Metall,* vol. 36, Aug. 1982, p. 882-888. In German.

High-alloy chromium and chromium-nickel steels are very suitable for a use as construction material in gas turbines operating at high temperatures and in jet engines. Nickel-chromium alloys containing aluminum are superior to cobalt-chromium alloys with respect to corrosion resistance. It is pointed out that the presence of halides and sulfur compounds in the combustion gases makes it necessary to utilize special approaches in order to keep the corrosion of expensive alloys, even at high temperatures, within acceptable limits. These approaches involve the development of oxidation-resistant materials which can provide a protective coating for the basic alloy. Possibilities are discussed for improving the inherent corrosion resistance of pure nickel with the aid of suitable alloying ingredients. G.R.

A82-41795 Simulated ILS using a laser tracker. L. H. Morinaga (Douglas Aircraft Co., Long Beach, CA). In: International Instrumentation Symposium, 27th, Indianapolis, IN, April 27-30, 1981, Proceedings. Part 1. Research Triangle Park, NC, Instrument Society of America, 1981, p. 347-355.

The Simulated ILS (Instrument Landing System) was developed to test and evaluate an aircraft's Autopilot modes, particularly autoland and ground rollout. This system utilizes a laser tracker to obtain continuous space position data of the test aircraft. A minicomputer software program determines the aircraft position relative to the test runway. Aircraft deviation from the center of a simulated ILS beam is calculated on the ground, telemetered to the test aircraft, and input to the airborne flight guidance system. Since beam simulation is accomplished in software, almost any type of desired simulation is possible. By the simulation of numerous actual airport ILS beams at a single test site, significant cost savings in flight time and fuel are realized. This system is currently in use on a major commercial aircraft flight-test program. (Author)

A82-41796 Analysis of flight data in the frequency domain. W. R. Wells (Wright State University, Dayton, OH) and S. S. Banda (Dayton, University, Dayton, OH). In: International Instrumentation Symposium, 27th, Indianapolis, IN, April 27-30, 1981, Proceedings. Part 1. Research Triangle Park, NC, Instrument Society of America, 1981, p. 357-365. 9 refs.

This paper describes the methods commonly used to process flight data in the frequency domain for application to aircraft parameter estimation. Estimates of stability and control derivatives were obtained by the use of maximum likelihood estimation methods in the frequency domain. The case used for illustration purposes is flight data from a single engine general aviation airplane. The airplane equations of motion included unsteady aerodynamics. The airplane responses were generated by using rudder and aileron deflections. Measured data is converted by a Fast Fourier Transform algorithm into the frequency domain. An interpolation technique such as 'zero packing' is demonstrated for the purpose of increasing the frequency sampling rate for the estimation algorithm. It was shown that the use of zero packing technique will improve the estimates of stability and control derivatives. (Author)

A82-41846 * Programmable controller system for wind tunnel diversion vanes. R. F. King (NASA, Ames Research Center, Moffett Field, CA). In: International Instrumentation Symposium, 28th, Las Vegas, NV, May 3-6, 1982, Proceedings. Part 1. Research Triangle Park, NC, Instrument Society of America, 1982, p. 457-463.

A programmable controller (PC) system automatic sequence control, which acts as a supervisory controller for the servos, selects the proper drives, and automatically sequences the vanes, was developed for use in a subsonic wind tunnel. Tunnel modifications include a new second test section (80 ft x 100 ft with a maximum air speed capability of 110 knots) and an increase in maximum velocity flow from 200 knots to 300 knots. A completely automatic sequence control is necessary in order to allow intricate motion of the 14 triangularly arranged vanes which can be as large as 70 ft high x 35 ft wide and which require precise acceleration and deceleration control. Rate servos on each drive aid in this control, and servo cost was minimized by using four silicon controlled rectifier controllers to control the 20 dc drives. The PC has a programming capacity which facilitated the implementation of extensive logic design. A series of diagrams sequencing the vanes and a block diagram of the system are included. R.K.R.

A82-41854 * A miniature electro-optical air flow sensor. D. D. Kershner (NASA, Langley Research Center, Cockpit Systems Branch, Hampton, VA). In: International Instrumentation Symposium, 28th, Las Vegas, NV, May 3-6, about one-half of their heads immersed, speeding hypothermia. Life vests designed for easy donning with improved buoyancy and hypothermia protection should be employed. Slide/rafts, like those already installed in wide-body aircraft, should be developed for narrow-body aircraft, and airports should develop emergency plans for water accidents. A.B.

A82-44293 **Problems with the use of percentages in the analysis of AAES data.** J. E. Vetter (U.S. Navy, Washington, DC). *SAFE Journal*, vol. 12, Fall 1982, p. 23-26, 28, 29.

Techniques for rectifying common problems with the statistical analysis of in-service usage data for aircrew automated escape systems are outlined and illustrated. The comparison of percentage data should be made with regard to the sample size and its variation. Percentage points can be plotted along with a bar representing the confidence level. Trend-line analysis should use the method of weighted least squares, when some points have a larger variance than others. Pie charts can make a decrease in one component appear as an increase in another unless sample size is included. Log-linear model analysis is recommended for the analysis of categorical data. A.B.

A82-44467 # **Mediating Mach's mechanics - Bombs away.** D. Spurgeon. *Science Dimension*, vol. 14, no. 4, 1982, p. 10, 12, 14.

The Canadian National Aeronautical Establishment's (NAE) approach to the problems posed when cargo is carried externally at the speed of sound is presented. At such speed flutter can occur, leading to the break-up of the vehicle. In addition, stores released at transonic speeds may rise after a short fall as the aircraft moves ahead, and eventually collide with the tail section. Wind tunnel experiments have been carried out using force-measuring devices to determine the results of simulated flying conditions. These results can be scaled up to approximate real conditions, and may reduce the number of flight tests needed, while increasing the safety of actual tests. By flying a loaded aircraft equipped with accelerometers in the wing tips, it is found that a precise velocity must not be exceeded in order to avoid flutter. Weight, type, and suspension of the stores carried can influence this velocity. Research on this problem has significant applications in the production of civilian aircraft. R.K.R.

A82-44468 **XV-15 program update.** T. Thomason (Bell Helicopter Textron, Tilt Rotor Aircraft Dept., Fort Worth, TX). *Vertiflite*, vol. 28, Sept.-Oct. 1982, p. 12-15.

After nearly 500 hours of total operating time, the operating characteristics of the Army/NASA XV-15 Tiltrotor aircraft are becoming clear. Level flight at 301 knots, and descent at 345 knots have been demonstrated, as well as operation at 24,500 feet and between -0.5 and +2.7 G's; more than 100 full conversions have been made from the helicopter to the airplane mode and back. In addition, the aeroelastic stability of the wing/pylon/rotor system, gust sensitivity and the effects of disk loading and tipspeed on downwash, noise and hover mode operations have been investigated, and do not limit the aircraft's capability, although further modifications are planned. The Joint Services Advanced Vertical Lift Aircraft Development Program has been initiated partly as a result of the demonstration of the Tiltrotor concept. A.B.

A82-44469 **It's too logical - It'll never work /Commercial applications of the JVX/.** J. F. Zugschwert. *Vertiflite*, vol. 28, Sept.-Oct. 1982, p. 24-27.

It is proposed that both military and commercial applications of V/STOL aircraft be developed by the Joint Services Advanced Vertical Lift Aircraft Fleet, the commercial models would be subject to, and suitable for wartime call-up. Such cross utilization would have the benefit of spreading the R & D and acquisition costs over a larger base, and of reducing the total operational flying hour cost by permitting a return on investment from the commercial aircraft. This proposal is also deemed appropriate for the Heavy Lift Helicopter and the Advancing Blade Concept aircraft. A.B.

A82-44470 **Helicopter commuters - An optimistic outlook.** L. K. Smith. *Vertiflite*, vol. 28, Sept.-Oct. 1982, p. 28-32.

Current operations of helicopter airline services in the United States are reviewed along with past attempts at providing such a service. Problems which plagued helicopter services in the past included: the high number of maintenance hours per flight hour, high seat mile costs, percentages of on-time departures, labor-managment problems, and the need for city center heliports. Technological advances have reduced maintenance time as well as reducing noise and vibration, and improving avionics and crashworthiness; it is expected that seat mile costs will also be made more competitive with those of fixed wing aircraft. The recent start of helicopter shuttle operations by major airlines for their first-class and business-class passengers has reinforced the conviction that there is a need for helicopter commuter services. A.B.

A82-44480 * # **Minimum fuel horizontal flight paths in the terminal area.** E. Kreindler and F. Neuman (NASA, Ames Research Center, Moffett Field, CA). *Journal of Guidance, Control, and Dynamics*, vol. 5, Sept.-Oct. 1982, p. 490-497. 16 refs.

A82-44481 # **Maximum likelihood failure detection of aircraft flight control sensors.** B. Friedland (Singer Co., Kearfott Div., Little Falls, NJ). *Journal of Guidance, Control, and Dynamics*, vol. 5, Sept.-Oct. 1982, p. 498-503. 11 refs.

A recently developed maximum likelihood failure detection algorithm, based on processing the residuals from an observer designed on the assumption of no failures, is applied to the problem of detecting and correcting gyro or accelerometer failures in the vertical axis of an aircraft flight control system. Design calculations are illustrated with a simplified dynamic model and the effectiveness of the failure detection method is demonstrated by simulation. (Author)

A82-44482 # **Minimum-time three-dimensional turn to a point of supersonic aircraft.** C.-F. Lin (Wisconsin, University, Madison, WI). *Journal of Guidance, Control, and Dynamics*, vol. 5, Sept.-Oct. 1982, p. 512-520. 13 refs.

The objective of this paper is to present real-time, on-line, minimum-time three-dimensional turn to a point of supersonic aircraft. The analytic aspect of the theory of optimal trajectories is emphasized. This includes the general properties of optimal trajectories consisting of the integrals of motion and the characteristic features in engine and aerodynamic controls. By using the integrals of motion the totality of the optimal trajectories can be obtained as a family of curves depending on a certain number of arbitrary constants. The optimal control is obtained by geometrical method through the domain of maneuverability. This makes explicit the switching characteristics of the optimal control, in particular when singular or chattering control is involved. The optimality of singular thrust control and the optimal junction of different subarcs are analyzed. The computation of the optimal trajectories is carried out using the aerodynamic and engine characteristics of a lightweight, high thrust-to-weight ratio supersonic fighter. By using normalized control variables, i.e., the thrust-to-weight ratio, the bank angle, and the load factor, results can be applied to any supersonic aircraft. (Author)

A82-44695 # **Design to life cycle cost capability of the PRICE models.** M. H. Burmeister (RCA, Cherry Hill, NJ). *International Astronautical Federation, International Astronautical Congress, 33rd, Paris, France, Sept. 27-Oct. 2, 1982, Paper 82-221.* 8 p.

PRICE is a family of three parametric cost predicting models, currently widely used in U.S. government and industrial circles. A number of European organizations also use the PRICE models. A case study, utilizing the PRICE Hardware and Life Cycle models, is presented here to illustrate the cost impact of maintainability considerations for Avionic equipment. The study depicts a trade-off analysis to assess the economic impact of designing equipment with two different technologies for changing deployment scenarios. This case study is not intended to provide a definitive answer on the level of technology to be employed in the design of avionics. Rather, the purpose of this analysis is to illustrate the flexibility and utility of parametric estimating models. Through the use of these parametric models, a practical method now exists to conduct multiple, rapid, design-to-life-cycle-cost trade-off analyses. (Author)

A82-44699 # **Consideration of an international private sector satellite search and rescue locating system.** C. M. Case (Boeing Aerospace Co., Seattle, WA). *International Astronautical Federation, International Astronautical Congress, 33rd, Paris, France, Sept. 27-Oct. 2, 1982, Paper 82-236.* 11 p. 24 refs.

This paper presents a rationale for the creation of a private sector organization to establish, finance, and operate an international satellite aided search and rescue locating system. The social and political impact of such a system on the global community is examined. Organizational structure, ownership, and control design issues are considered using Intelsat and Inmarsat as models. Questions of financial support including source and stability of income streams are addressed. Search and rescue requirements and satellite design trades are considered, and a conceptual network design is described. (Author)

STAR ENTRIES

N82-30283*# National Aeronautics and Space Administration. Washington, D. C.
NASA AERONAUTICS
David A. Anderson [1982] 30 p Original contains color illustrations
(NASA-EP-85; NAS 1.19:85) Avail: NTIS MF A01; SOD HC $2.50 as 033-000-00796-5 CSCL 01B

Aeronautical research programs are discussed in relation to research methods and the status of the programs. The energy efficient aircraft, STOL aircraft and general aviation aircraft are considered. Aerodynamic concepts, rotary wing aircrft, aircraft safety, noise reduction, and aircraft configurations are among the topics included. S.L.

N82-30287*# National Aeronautics and Space Administration. Washington, D. C.
AERODYNAMICS ON A TRANSPORT AIRCRAFT TYPE WING-BODY MODEL
V. Schmitt May 1982 30 p refs Transl. into ENGLISH of "Aerodynamique dun ensemble voilure-fuselage du type 'avion de transport" (France), no. ONERA-TP-1981-122, 1981 p 1-23 Presented at the 18th Colloq. on Appl. Aerodyn. of AAAF, Poiteriers, France, 18-20 Nov. 1981 Original document announced as A82-19738 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3541)
(NASA-TM-76878; NAS 1.15:76878) Avail: NTIS HC A03/MF A01 CSCL 01A

The DFLR-F4 wing-body combination is studied. The 1/38 model is formed by a 9.5 aspect ratio transonic wing and an Airbus A 310 fuselage. The F4 wing geometrical characteristics are described and the main experimental results obtained in the S2MA wind tunnel are discussed. Both wing-fuselage interferences and viscous effects, which are important on the wing due to a high rear loading, are investigated by performing 3D calculations. An attempt is made to find their limitations. S.L.

N82-30288*# Oklahoma State Univ., Stillwater. Dept. of Mechanical Engineering.
FLOW AND ACOUSTIC PROPERTIES OF LOW REYNOLDS NUMBER UNDEREXPANDED SUPERSONIC JETS Ph.D. Thesis
Tieh-Feng Hu 1977 146 p refs
(Contracts NAG1-159; NAG1-10)
(NASA-CR-169257; NAS 1.26:169257) Avail: NTIS HC A07/MF A01 CSCL 01A

Jet noise on underexpanded supersonic jets are studied with emphasis on determining the role played by large scale organized flow fluctuations in the flow and acoustic processes. The experimental conditions of the study were chosen as low Reynolds number (Re = 8,000) Mach 1.4 and 2.1, and moderate Reynolds number (Re = 68,000) Mach 1.6 underexpanded supersonic jets exhausting from convergent nozzles. At these chosen conditions, detailed experimental measurements were performed to improve the understanding of the flow and acoustic properties of underexpanded supersonic jets. S.L.

N82-30289*# Systems Technology, Inc., Hawthorne, Calif.
STABILITY AND CONTROL OF THE GOSSAMER HUMAN POWERED AIRCRAFT BY ANALYSIS AND FLIGHT TEST Final Report, Jan. 1980 - Dec. 1981
Henry R. Jex Jan. 1982 82 p refs Prepared for AeroVironment, Inc.
(Contract NAS4-2705)
(NASA-CR-163119; NAS 1.26:163119; STI-TR-2109-1; AV-R-82/520) Avail: NTIS HC A05/MF A01 CSCL 01A

A solar cell electric-powered aircraft was investigated in relation to performance, stability and control. The performance properties, such as lift to drag, power required, propeller efficiency, and trim speed effects were studied. The dynamic response properties to various control inputs to verify the computed stability and control characteristics were also investigated. S.L.

N82-30290*# National Aeronautics and Space Administration. Washington, D. C.
FLOW AND PRESSURE FIELD OF A MODEL PROPELLER
Rudolf Neubauer and Klaus-Peter Anders Feb. 1982 12 p refs Transl. into ENGLISH of "Stromungs und Druckfeld eines Modellpropellers" West Germany, 1977 8 p Presented at the 10th Jahrestagung, West Berlin, 13-15 Sep. 1977 Original language document announced as A78-24451 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by DFVLR, Brunswick
(Contract NASw-3542)
(NASA-TM-76690; NAS 1.15:76690) Avail: NTIS HC A02/MF A01 CSCL 01A

To examine the problem of noise reduction of propeller aircraft, a disturbance free method is presented for visualization of pressure gradients and flows by means of a Schlieren configuration. The flow and pressure field of a model propeller was represented using a running film. Aspects of Schlieren and model technology are commented on. Author

N82-30291*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROPROPULSIVE CHARACTERISTICS OF MACH NUMBERS UP TO 2.2 OF AXISYMMETRIC AND NON-AXISYMMETRIC NOZZLES INSTALLED ON AN F-18 MODEL
Francis J. Capone Aug. 1982 80 p refs
(NASA-TP-2044; L-15208; NAS 1.60:2044) Avail: NTIS HC A05/MF A01 CSCL 01A

An investigation to determine the aeropropulsive characteristics of nonaxisymmetric nozzles on an F-18 jet effects model was conducted in the Langley 16-foot transonic tunnel and the AEDC 16-foot supersonic wind tunnel. The performance of a two dimensional convergent-divergent nozzle, a single expansion ramp nozzle, and a wedge nozzle was compared with that of the baseline axisymmetric nozzle. Test data were obtained at static conditions and at Mach numbers from 0.60 to 2.20 at an angle of attack of 0 deg. Nozzle pressure ratio was varied from jet-off to about 20. Author

N82-30293# Naval Surface Weapons Center, White Oak, Md.
EFFECTS OF CANOPY GEOMETRY AND CLOTH PERMEABILITY ON THE DRAG COEFFICIENT OF A CROSS PARACHUTE IN THE FULLY OPEN AND REEFED CONDITIONS FOR A W/A RATIO OF 0.3 Final Report, FY 1981
W. P. Ludtke 1 Feb. 1982 77 p
(AD-A115046; AD-F500030; NSWC/TR-81-441) Avail: NTIS HC A05/MF A01 CSCL 01/3

This report describes a series of wind-tunnel tests on the cross-type parachute to investigate the effects of cloth permeability, number of suspension lines, and suspension line length in the fully opened and reefed conditions. Forty-inch-diameter models with a canopy arm width-to-length ratio (W/L) of 0.3 were tested at various velocities from 50 fps to 293 fps in the fully inflated state. Results of these tests demonstrate that the parachute geometry and cloth permeability do have an effect on the drag capability of the cross parachute. Additional tests of reefed configurations for several reefing line lengths-to-canopy-diameter ratios from 0.6 to 1.6 at a constant velocity of 203 fps established the reefed characteristics of this parachute. The steady state forces in the reefing line were measured by use of strain gage links. Data are presented in tabular and graphical format. Photographs of representative canopy shapes are included for illustration. GRA

N82-30296# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Entwurfsaerodynamik.
WIND TUNNEL INVESTIGATIONS ON THIN SUPERCRITICAL AIRFOILS IN HIGH SUBSONIC FLOW
Horst Koerner and Wolfgang Puffert-Meissner Feb. 1982 63 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-774)
(DFVLR-FB-82-06; ESA-TT-774) Avail: NTIS HC A04/MF A01; DFVLR, Cologne DM 19.30

Four thin airfoils (t/c = 0.05) were investigated experimentally. The aerodynamic efficiency of three supercritical airfoils is compared with that of a conventional one. The investigation was conducted in a transonic wind tunnel within a Mach number

Head-Up Display (HUD) system; (2) Air-to-air lead angle computation for the HUD air-to-air gunsight; (3) Air-to-ground weapon depression and across-wind aimpoint computation for the HUD air-to-ground Continuously Computed Impact Point (CCIP) weapon release cue; and (4) Breakway warning computation for terrain and weapon fragmentation avoidance for the HUD air-to-ground CCIP mode. GRA

N82-31329*# Georgia Inst. of Tech., Atlanta. School of Aerospace Engineering.

DEVELOPMENT OF A SPINNING WAVE HEAT ENGINE Final Report

B. T. Zinn, E. A. Powell, and J. E. Hubbartt Aug. 1982 100 p refs

(Grant NAG3-96)

(NASA-CR-165611; NAS 1.26:165611) Avail: NTIS HC A05/MF A01 CSCL 21E

A theoretical analysis and an experimental investigation were conducted to assess the feasibility of developing a spinning wave heat engine. Such as engine would utilize a large amplitude traveling acoustic wave rotating around a cylindrical chamber, and it should not suffer from the inefficiency, noise, and intermittent thrust which characterizes pulse jet engines. The objective of this investigation was to determine whether an artificially driven large amplitude spinning transverse wave could induce a steady flow of air through the combustion chamber under cold flow conditions. In the theoretical analysis the Maslen and Moore perturbation technique was extended to study flat cylinders (pancake geometry) with completely open side walls and a central opening. In the parallel experimental study, a test moel was used to determine resonant frequencies and radial pressure distributions, as well as oscillatory and steady flow velocities at the inner and outer peripheries. The experimental frequency was nearly the same as the theoretical acoustic value for a model of the same outer diameter but without a central hole. Although the theoretical analysis did not predict a steady velocity component, simultaneous measurements of hotwire and microphone responses have shown that the spinning wave pumps a mean flow radially outward through the cavity. Author

N82-31330*# Drexel Univ., Philadelphia, Pa. Dept. of Mechanical Engineering and Mechanics.

SINGULAR PERTURBATION TECHNIQUES FOR REAL TIME AIRCRAFT TRAJECTORY OPTIMIZATION AND CONTROL Final Report, Feb. 1978 - Dec. 1981

Anthony J. Calise and Daniel D. Moerder NASA Washington Aug. 1982 111 p refs

(Grant NsG-1496)

(NASA-CR-3597; NAS 1.26:3597) Avail: NTIS HC A06/MF A01 CSCL 01C

The usefulness of singular perturbation methods for developing real time computer algorithms to control and optimize aircraft flight trajectories is examined. A minimum time intercept problem using F-8 aerodynamic and propulsion data is used as a baseline. This provides a framework within which issues relating to problem formulation, solution methodology and real time implementation are examined. Theoretical questions relating to separability of dynamics are addressed. With respect to implementation, situations leading to numerical singularities are identified, and procedures for dealing with them are outlined. Also, particular attention is given to identifying quantities that can be precomputed and stored, thus greatly reducing the on-board computational load. Numerical results are given to illustrate the minimum time algorithm, and the resulting flight paths. An estimate is given for execution time and storage requirements. Author

N82-31331# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. Dept. of Electrical Engineering.

DESIGN OF ADVANCED DIGITAL FLIGHT CONTROL SYSTEMS VIA COMMAND GENERATOR TRACKER (CGT) SYNTHESIS METHODS, VOLUME 1 M.S. Thesis

Richard M. Floyd Dec. 1981 226 p refs 2 Vol.

(AD-A115510; AFIT/GE/EE/81-20-Vol-1) Avail: NTIS HC A11/MF A01 CSCL 01/2

This study develops a computer program for interactive execution to aid in the design of Command Generator Tracker control systems employing Proportional-plus-Integral inner-loop controllers and Kalman Filters for state estimation (CGT/PI/KF controllers). Design parameters are specified in the continuous-time domain and the computer program obtains the corresponding discrete-time parameters and determines a direct digital design for sampled-data implementation. Designs are based upon the Linear system mode, Quadratic cost, and Gaussian noise process (LQG) assumptions of optimal control theory. The report discusses the theoretical background and applications of optimal model-following designs which preceded the CGT theory. A development of the CGT/PI/KF controller theory is presented, and performance evaluation tools for the controller design are discussed. Following a brief description of the computer program developed, results of applying it to example aircraft-related controller design problems are presented and discussed. GRA

N82-31332# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. Dept. of Electrical Engineering.

DESIGN OF ADVANCED DIGITAL FLIGHT CONTROL SYSTEMS VIA COMMAND GENERATOR TRACKER (CGT) SYNTHESIS METHODS, VOLUME 2 M.S. Thesis

Richard M. Floyd Dec. 1981 246 p refs 2 Vol.

(AD-A115511; AFIT/GE/EE/81-20-Vol-2) Avail: NTIS HC A11/MF A01 CSCL 01/2

CGTPIF is a controller design program which executes interactively. Three design paths are offered: (1) design of a Proportional-plus-Integral (PI) regulator via linear-quadratic (LQ) methodology; (2) design of a Command Generator Tracker, either open-loop (CGT) or closed-loop (CGT/PI); and (3) design of a Kalman filter (KF). These three designs are components of a final controller implemented as a Command Generator Tracker, with an inner-loop proportional-plus-integral regulator, and a Kalman filter for state estimation (CGT/PI/KF). For each design path there is a corresponding set of routines to evaluate the quality of the design achieved. The program is written in FORTRAN IV and consists of about 2500 lines of source code. In addition, numerous routines are employed from a library of matrix routines described in Reference 24. Author (GRA)

N82-31333# Vereinigte Flugtechnische Werke G.m.b.H., Bremen (West Germany).

DESCRIPTION OF A SIMPLE MODEL TO DETERMINE LANDING GEAR FORCES DURING THE TAKEOFF OF AERODYNAMICALLY UNSTABLE AIRCRAFT [BESCHREIBUNG EINES EINFACHEN MODELLS ZUR ERMITTLUNG VON FAHRWERKSKRAEFTEN WAEHREND DES STARTVORGANGS EINES AERODYNAMISCHES INSTABILEN FLUGZEUGS]

M. Soelter 25 Nov. 1981 43 p refs In GERMAN

(EX-22B) Avail: NTIS HC A03/MF A01

A simple model to simulate the lateral motion during the takeoff of an aerodynamically unstable aircraft is presented. By neglecting the landing gear dynamics no additional solution of the corresponding differential equations was required. Landing gear forces were determined from the geometrical ratios of the aircraft to the ground reference line. This procedure is particularly efficient when no high frequency landing gear drive-as, e.g., during touchdown has to be taken into account. The objection free function of the control concept for an aircraft aerodynamically unstable in the lateral plane is shown. Author (ESA)

N82-31335# Goulding (Merril K.) and Associates, Glendale, Calif.

STUDY OF THE DE-ICING PROPERTIES OF THE ASDE-3 ROTODOME Final Report, Sep. 1978 - Sep. 1980

Merrill K. Goulding Washington FAA Apr. 1982 132 p refs

(Grant DOT-TSC-15950)

(AD-A115445; DOT/FAA/RD-81/112; DOT-TSC-FAA-81-24; DTS-541) Avail: NTIS HC A07/MF A01 CSCL 01/5

A study was conducted of the thermal characteristics of the

ASDE-3 system's rotating radome (rotodome), a spheri-toroidal thin wall structure, approximately 16 feet in diameter and 6 feet in height. The purpose of the study was to determine the thermal transmissivities of the various regions of the design, discover 'hot spots,' determine the need for insulation, heater exhaust deflectors and other enhancements, and to make a prediction of the ability of its heaters to prevent system outages due to ice accretion on the rotodome. An analysis made using test data to predict the ability of the rotodome to resist icing conditions was very encouraging, demonstrating that convection becomes the dominant mode of heat loss during high wind conditions. A conservative analysis was made with winds applied at full velocity across all regions of the rotodome. The results indicate that the goal of de-icing the rotodome appears achievable using 30 kW of power. Although there are hot spots about the rotodome, the de-icing function using the hot air blower system is satisfactory. To reduce hot spots near the blower assembly, a deflector is recommended at the output of the blower. Author (GRA)

N82-31336# American Airlines, Inc., Ft. Worth, Tex.
WIDE-ANGLE, MULTIVIEWER, INFINITY DISPLAY SYSTEM Final Report
Ian Whyte and A. W. Zepf Jun. 1982 95 p refs
(Contract F33615-79-C-0002)
(AD-A116306; AFHRL-TR-81-27(1)) Avail: NTIS HC A05/MF A01 CSCL 05/9

This study examined the design specification for a wide angle infinity display system with minimal distortion, convergence, dipvergence, and collimation errors for use on wide body aircraft simulators. The report includes a recommended final design specification; a survey of potential fabrication technologies for projector, screen and large mirrors; an approach to fabrication of a large display system; and finally, assembly and alignment techniques of mirror segments for a large display. (Note: Dipvergence refers to vertical movement of eyes up and down as opposed to side to side.) GRA

N82-31338# Calspan Field Services, Inc., Arnold Air Force Station, Tenn.
CALIBRATION AND PERFORMANCE OF THE AEDC/VKF TUNNEL C, MACH NUMBER 4, AEROTHERMAL WIND TUNNEL Final Report, 15 May - 18 Dec. 1981
W. T. Strike, Jr. Jun. 1982 117 p refs
(AD-A116279; AEDC-TR-82-6) Avail: NTIS HC A06/MF A01 CSCL 14/2

The shakedown and calibrated characteristics of the new AEDC Mach Number 4 Aerothermal Wind Tunnel were experimentally identified at several test conditions. The nominal Mach number of the test core as defined by a 30-probe pitot pressure rake varied between nominally 3.95 and 4.0, depending on the test section Reynolds number and stilling chamber temperature. The overall variation in the stilling chamber pressure is nominally 15 to 180 psia, with temperatures from 250 to 1,210 F for an overall Reynolds number range of 0.2 to 8.1 million per foot and true temperature-pressure altitude simulation from 56,000 to 105,000 ft. Author (GRA)

N82-31448*# Douglas Aircraft Co., Inc., Long Beach, Calif.
KEVLAR/PMR-15 REDUCED DRAG DC-9 REVERSER STANG FAIRING
R. T. Kawai Aug. 1982 140 p refs
(Contract NAS3-21763)
(NASA-CR-165448; NAS 1.26:165448) Avail: NTIS HC A07/MF A01 CSCL 11D

A reduced drag fairing for the afterbody enclosing the thrust reverser actuators on the DC-9 has been developed with Kevlar-49/PMR-15 advanced composite material. The improved fairing reduces airplane drag 1% compared to the production baseline. Use of composites reduces weight 40% compared to an equivalent metal fairing. The Kevlar-49/PMR-15 advanced composite is an organic matrix material system that can be used at temperatures up to 500 F. Author

N82-31449*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ENVIRONMENTAL AND HIGH-STRAIN RATE EFFECTS ON COMPOSITES FOR ENGINE APPLICATIONS
C. C. Chamis and G. T. Smith 1982 20 p refs Presented at the 23rd Struct. Dyn. and Mater. Conf., New Orleans, 10-12 May 1982; sponsored by AIAA, ASME, ASCE, and AHS Previously announced in IAA as A82-30110
(NASA-TM-82882; NAS 1.15:82882) Avail: NTIS HC A02/MF A01 CSCL 11D

The Lewis Research Center is conducting a series of programs intended to investigate and develop the application of composite materials to structural components for turbojet engines. A significant part of that effort is directed to establishing resistance, defect growth, and strain rate characteristics of composite materials over the wide range of environmental and load conditions found in commercial turbojet engine operations. Both analytical and experimental efforts are involved. Author

N82-31546*# Lockheed-California Co., Burbank.
ADDITIONAL EXPERIMENTS ON FLOWABILITY IMPROVEMENTS OF AVIATION FUELS AT LOW TEMPERATURES, VOLUME 2 Final Report
Francis J. Stockemer and Ronald L. Deane Aug. 1982 56 p refs
(Contract NAS3-21977)
(NASA-CR-167912; NAS 1.26:167912) Avail: NTIS HC A04/MF A01 CSCL 21D

An investigation was performed to study flow improver additives and scale-model fuel heating systems for use with aviation hydrocarbon fuel at low temperatures. Test were performed in a facility that simulated the heat transfer and temperature profiles anticipated in wing fuel tanks during flight of long-range commercial aircraft. The results are presented of experiments conducted in a test tank simulating a section of an outer wing integral fuel tank approximately full-scale in height, chilled through heat exchange panels bonded to the upper and lower horizontal surfaces. A separate system heated lubricating oil externally by a controllable electric heater, to transfer heat to fuel pumped from the test tank through an oil-to-fuel heat exchanger, and to recirculate the heated fuel back to the test tank. B.W.

N82-31548# Naval Postgraduate School, Monterey, Calif.
AN INVESTIGATION OF THE EFFECTS OF SMOKE SUPPRESSANT FUEL ADDITIVES ON ENGINE AND TEST CELL EXHAUST GAS OPACITIES Final Report, 1981
Donald W. Thornburg, Thomas R. Darnell, and David W. Netzer May 1982 116 p refs
(AD-A116171; NPS67-82-004) Avail: NTIS HC A06/MF A01 CSCL 21/4

Tests were conducted in a one-eighth scale turbojet test cell with a ramjet type combustor to investigate the effects of fuel additives on smoke reduction. Particle size and mass concentrations were determined at the engine and stack exhausts using three wavelength optical detector systems. Particulate samples were also collected at the engine exhaust and analyzed with a scanning electron microscope. Combustor temperature and fuel additives were found to significantly affect particulate mass concentrations emitted from the engine while particle size appeared to be unaffected. No significant changes in the particulate size or mass occurred from the engine exhaust to the stack exhaust. The optical determination of exhaust mean particulate size/mass concentration with three wavelength optical detector systems appears to be reasonably accurate technique for evaluating the effects of engine and test cell operating conditions and fuel composition changes on the emitted particulates. Author (GRA)

N82-31589# Southampton Univ. (England). Inst. of Sound and Vibration Research.
[ACTIVITIES OF THE INSTITUTE OF SOUND AND VIBRATION RESEARCH] Annual Report, Mar. 1982
1982 49 p refs

COCKPITS
NASA studies business aircraft avionics A82-43659
Evaluation of the FAA/AITBE weather data device [AD-A114646] N82-30800
Separation monitoring with four types of predictors on a cockpit display of traffic information N82-30860
CODING
Design of advanced digital flight control systems via Command Generator Tracker (CGT) synthesis methods, volume 2 [AD-A115511] N82-31332
COLLIMATORS
Wide-angle, multiviewer, infinity display system [AD-A116308] N82-31336
COLLISION AVOIDANCE
Air-air anticollision systems [SEE PAPER 811764] A82-44235
Functional design to support CDTI/DABS flight experiments [NASA-CR-165947] N82-31326
COLOR INFRARED PHOTOGRAPHY
Photointerpretation key for pine regeneration analysis using high-altitude color infrared panoramic photography [PB82-164450] N82-30606
COMBUSTION PHYSICS
Thermodynamic and transport combustion properties of hydrocarbons with air. Part 1: Properties in SI units [NASA-TP-1906] N82-32186
Thermodynamic and transport combustion properties of hydrocarbons with air. Part 2: Compositions corresponding to Kelvin temperature schedules in part 1 [NASA-TP-1907] N82-32187
Thermodynamic and transport combustion properties of hydrocarbons with air. Part 3: Properties in US customary units [NASA-TP-1908] N82-32188
Thermodynamic and transport combustion properties of hydrocarbons with air. Part 4: Compositions corresponding to Rankine temperature schedules in part 3 [NASA-TP-1909] N82-32189
COMMERCIAL AIRCRAFT
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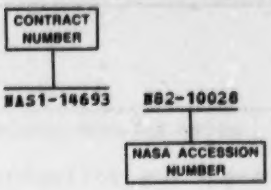

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1982, Proceedings. Part 2. Research Triangle Park, NC, Instrument Society of America, 1982, p. 645-652.

Miniature sensors are needed for rapid and uncomplicated installation on light aircraft engaged in stability research programs. One particularly difficult sensor to miniaturize to the required degree has been a flow angle and velocity sensor for measuring the local flow ahead of a wing. However, by using an electrooptical technique it was possible to overcome the encountered difficulties and to design a sensor satisfying the requirements. The developed sensor for measuring angle-of-attack, yaw, and airspeed was shown to be suitable for rapid instrumentation of research aircraft because of its small size. The size reduction was accomplished by a design feature which eliminates the need for slip rings and wiring within the movable components of the sensor. G.R.

A82-41868 * A floating-point/multiple-precision processor for airborne applications. R. Yee (NASA, Ames Research Center, Moffett Field, CA). In: International Instrumentation Symposium, 28th, Las Vegas, NV, May 3-6, 1982, Proceedings. Part 2. Research Triangle Park, NC, Instrument Society of America, 1982, p. 857-864.
(Previously announced in STAR as N82-26289)

A82-41869 Integrated sensor system for flight test instrumentation. L. D. Plews (USAF Flight Test Center, Edwards AFB, CA). In: International Instrumentation Symposium, 28th, Las Vegas, NV, May 3-6, 1982, Proceedings. Part 2. Research Triangle Park, NC, Instrument Society of America, 1982, p. 865-873.

The motivation for the integrated sensor system (ISS) was to take advantage of advances in strapdown inertial navigation systems and microcomputer technology to improve flight test efficiency at lower cost by providing a standard interface with the data acquisition system, aircraft sensors, and onboard flight-/navigation computers. The ISS will generate flight test data in a form which can be used to document the aerodynamic properties of the test aircraft. Flight tests applications are related to performance testing, stability and control testing, and pre and poststall flying qualities testing. Attention is given to data accuracy, sensors for performance and flying qualities testing, a system definition, the ISS computer, the ISS interface, the inertial measurement unit, the air data system, and aspects of implementation. G.R.

A82-41881 # Requirements and possible design choices for improving the operation of aircraft in the terminal control area (Requisiti e possibili scelte di progetto per migliorare la operatività degli aeromobili in area di controllo terminale). F. Bossa. *Ingegneria,* May-June 1982, p. 130-136. 6 refs. In Italian.

Ways to optimize operations in the terminal control area are discussed with particular reference to the Terminal Configured Vehicle Program. Attention is given to criteria for the design of aircraft that are compatible with the terminal control area. Questions of aircraft noise and airport congestion are examined. B.J.

A82-41888 Hover jam - US Army studies EW helicopter. D. Boyle. *Interavia,* vol. 37, Aug. 1982, p. 760-762.

An airborne radar jamming system (ARJS) has been conceived to provide tactical jamming and operational flexibility necessary to suppress enemy radars (e.g., surveillance, anti-mortar, and anti-artillery radars) to protect attack helicopters and close air support aircraft. The ARJS electronic system is similar to EA-6B and EF-111 systems, but is lighter and simpler. Three frequency bands would have to be covered by the ARJS, reducing power and cooling requirements, as opposed to eight covered by the EF-111 system; but within these three bands, more radar frequencies would have to be covered. The ALQ-99 tactical jamming system is fundamental to the ARJS, and developments include mechanically steerable antennas in the pods. Other developments are underway such as the use of phased lens arrays, and an increased need for battlefield support jamming is foreseen. R.K.R.

A82-41914 Acoustic emission inspection of aircraft engine turbine blades for intergranular corrosion. W. D. Feist (Motoren- und Turbinen-Union München GmbH, Munich, West Germany). *NDT International,* vol. 15, Aug. 1982, p. 197-200.

The depth of the intergranular corrosion on turbine blades is of decisive significance with regard to their suitability for continued use. An acoustic emission method is introduced that is suitable for examination of blades during regular engine overhaul and which permits a statement on the depth of the corrosion to be made. (Author)

A82-41951 Long-range radio NAVAID signal reliability. W. B. Ruhnow (Rockwell International Corp., Cedar Rapids, IA). *Navigation,* vol. 29, Summer 1982, p. 152-159.

The results of a continuing study of Loran-C, VLF communication and Omega long range radio navigation signal reliability are updated. MTBF and mean time to repair statistics are given for the ground stations of the three systems, and trends in failure statistics from late 1973 to 1981 are presented in yearly and half-year intervals. The trends show that while the Loran-C signal reliability has improved significantly in recent years, VLF communication stations show random fluctuations which degrade performance in certain years and Omega signal integrity has remained constant since 1973. The 1981 probability of completing a stated mission of given duration is calculated for each transmitter type in zero- or two-station redundancy situations. The redundant signal coverage calculations show that airborne equipment should be structured to take advantage of redundant signals which have good geometry. O.C.

A82-42035 1980 Conference on Propeller Propulsion, Dayton, OH, April 22-24, 1980, Proceedings. Conference sponsored by AIAA, AHS, SAE, and University of Dayton. Edited by B. Lindenbaum, D. L. Quam, W. T. Grady (Dayton, University, Dayton, OH), J. R. Hunter (Boeing Co., Seattle, WA), E. J. Leach (United Technologies Corp., Hamilton Standard Div., Windsor Locks, CT), and J. J. Lusczek, Jr. (USAF, Washington, DC). New York, American Institute of Aeronautics and Astronautics, 1982. 157 p. $25.

Following a report on conference results, and a series of reports on the deliberations of panels on aircraft design and manufacture, propulsion system performance, propulsion hardware design and manufacture, and noise and vibration, the topics presented at this conference on the development status of propeller and propeller fan aircraft propulsion systems include Navy, Air Force and Commercial user views of propeller propulsion, the application of this technology to general aviation aircraft, and NASA research on low to high speed propeller systems. Also considered are the aerodynamic and structural analyses of propeller fan systems, the mechanical drive requirements of turboshaft gas turbine engines, the prospective fuel efficiency gains of state-of-the-art propeller propulsion systems, and the aerodynamic compatibility of propellers and the wing and fuselage flows with which they interact. O.C.

A82-42055 † Models for controlling reliability in aviation (Modeli upravleniia nadezhnost'iu aviatsionnoi tekhniki). V. P. Molomin. Moscow, Izdatel'stvo Mashinostroenie, 1981 200 p. 91 refs. In Russian.

Ways of formalizing and optimizing the control of reliability are considered, with an allowance made for the maintainability and useful life of parts and units that are serviced in processes that involve several stages (the extent of control differing in each stage). The mathematical models required to provide the basis for the operational control actions that are optimum in relation to reliability control are elaborated. C.R.

A82-42059 † Repair and maintenance of buildings in civil aviation (Ekspluatatsiia i remont zdanii grazhdanskoi aviatsii). A. M. Malyshkov and Iu. Ia. Berlin. Moscow, Izdatel'stvo Transport, 1981. 224 p. 28 refs. In Russian.

Basic information is presented in this handbook on the repair and maintenance of civil-aviation buildings, with particular reference to the situation in the Soviet Union. A classification of such buildings is presented, and their structural and equipment requirements are considered. Regulations concerning the planning, financing, and organization of repair operations are examined. B.J.

A82-42063 † Structural strength of materials and parts of gas turbine engines (Konstruktsionnaia prochnost' materialov i detalei gazoturbinnykh dvigatelei). I. A. Birger, B. F. Balashov, R. A. Dul'nev, T. P. Zakharova, L. A. Kozlov, A. N. Petukhov, and R. N. Sizova. Moscow, Izdatel'stvo Mashinostroenie, 1981. 224 p. 90 refs. In Russian.

Aspects of the study of the fatigue strength, thermal fatigue, and long-term strength of the materials and parts of gas turbine engines are reviewed. Particular consideration is given to fatigue-test methods, low-cycle fatigue under isothermal and nonisothermal loading, and determinate and statistical models of fracture. B.J.

A82-42066 † A history of aerostatics and aviation in Russia - In the period up to 1914 /2nd revised and enlarged edition/ (Istoriia vozdukhoplavaniia i aviatsii v Rossii - Period do 1914 g /2nd revised and enlarged edition/). P. D. Duz'. Moscow, Izdatel'stvo Mashinostroenie, 1981. 272 p. 52 refs. In Russian.

A history of the planning and building of piloted balloons, dirigibles, and airplanes in Russia, focusing on the period 1861-1914, is presented based on an extensive use of archival and published documentation. Following a survey of the designing and testing of piloted balloons up to 1861, the development of theoretical aerodynamics in Russia is examined, including the work of Tsiolkovskii and Zhukovskii. The pioneer efforts in the construction of airplanes in Russia are treated in detail, including the first airplanes designed and built by Sikorsky. N.B.

A82-42067 † Aircraft radio communications equipment: Design and use (Samoletnoe radiooborudovanie sviazi: Ustroistvo i ekspluatatsiia). A. P. Shved, Iu. V. Efremenkov, and F. F. Tiagun. Moscow, Izdatel'stvo Transport, 1981. 264 p. In Russian.

Descriptions are given of the Mikron and Landysh radio sets, the SPU-7 interphone, the SGS-25 loudspeaker system, and the Arfa-MB, MS-61, and Mars-BM tape recorders. Attention is also given to the operation of the equipment and to prospects for the development of shortwave and ultrashort-wave radio sets. C.R.

A82-42176 **Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings.** Symposium sponsored by IEEE, AIAA, ASME, et al. New York, Institute of Electrical and Electronics Engineers, 1982. 548 p. Members, $30.; nonmembers, $40.

Topics considered include reliability and the rare event, life-cycle costing, screening, new developments in analysis, software reliability, equipment readiness, new developments in mathematics and modeling, R&M data systems, new developments in testability, manufacturing reliability, and reliability testing. Case histories are presented on mechanical reliability, energy, consumer and industrial projects, maintainability, transportation, and military and aerospace. Aspects of reliability in the Space Shuttle program are discussed. B.J.

A82-42178 **Repair-discard concepts in design.** J. K. Seger (Lockheed-California Co., Burbank, CA). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 21-24.

The repair-discard and expanded repair-level analysis methodology is being developed at Lockheed, and initial experience shows that this methodology is a practical means for determining LRU (line replaceable unit) and SRU (shop replaceable unit) maintenance policy. This methodology provides a structured approach for proposing design changes and for assessing the impact of economic and operational factors when the objective is to achieve mission and readiness requirements at a minimum life cycle cost. The methodology complements the logistic support analysis process of MIL-STD 1388. B.J.

A82-42181 # **R/M/LCC effects of commercial off-the-shelf equipment.** P. R. MacDiarmid, A. D. Pettinato (USAF, Rome Air Development Center, Griffiss AFB, NY), and B. G. Johnson (Rockwell International Corp., Cedar Rapids, IA). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 40-46. 8 refs.

This paper addresses the effects of using commercial off-the-shelf equipment in military environments. Comparisons are made of military vs commercial reliability approaches and an analytical approach for choosing the most appropriate acquisition strategy is presented. Life cycle cost comparisons are made of commercial off-the-shelf equipment vs similar militarized equipment in military environments. Examples are presented of assessing risks under varying applications and choosing the best acquisition strategy. (Author)

A82-42206 # **F-16 Centralized Data System /CDS/.** G. M. Arnold (USAF, Aeronautical Systems Div., Wright-Patterson AFB, OH). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 326-328.

This paper describes a data system developed for the F-16 System Program Office (SPO). This Centralized Data System (CDS) contains F-16 maintenance, operational, and configuration data which is used for engineering and management information. Existing data sources within the Air Force are used and special queries and transmission procedures were developed. The existing data sources utilized included various base level tapes. These tapes contain operational and maintenance information and are updated on a daily basis. Mitron tape transmitters are then used to transfer the data from the base locations to the contractor's centralized computers. The contractors facility uses two Honeywell 852s and a Honeywell 820 to process and store the information. (Author)

A82-42208 **Economic analysis for data base management.** F. M. Hall (Evaluation Research Corp., Arlington, VA). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 343-352. 11 refs.

The purpose of this paper is to establish those factors which must be evaluated and properly structured to institute a cost effective field data collection system to support a system readiness improvement program. Factors outlined in this paper represent decision points to tailor a data collection system which effectively contributes to a readiness improvement program at a level which is equal to the cost of the data system. Cost-effectiveness is determined through a detailed evaluation and comparison of: (1) the cost of obtaining information; and (2) the value and benefits of information obtained. In order to relate some practical experience in the use of field data for operational readiness improvement, a brief review is provided on Department of Defense experience with large-scale field data collection systems. The proposed analysis procedure does not assume that a dedicated readiness data collection system is required for any program. The functions of data collection and analysis are evaluated for return on investment in the same manner as other systems effectiveness engineering elements within a program. If a cost-benefit analysis of a proposed data collection system indicates a low rate of return, resources should be reallocated to other functions, such as reliability design analysis, parts and material control, production readiness planning, or testing. (Author)

A82-42210 **Fault isolation BITE for increased productivity.** C. R. Stander (Boeing Commercial Airplane Co., Seattle, WA). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 365-369.

The paper discusses the potential effect of fault isolation on productivity, the development of BITE (built-in test equipment) on the 757/767 aircraft, and a new analytical method for verifying the level of system fault isolation efficiency. It is noted that the 757/767 BITE is designed for the mechanic, not the engineer. It eliminates such problems as the inability to deal with intermittent faults, and is expected to lead to improved aircraft productivity through improved schedule reliability and decreased maintenance cost. B.J.

A82-42211 # **Analysis of built-in-test accuracy.** D. Gleason (USAF, Rome Air Development Center, Griffiss AFB, NY). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 370-372.

Built-in-test (BIT) accuracy is a combined measure of fault detection capability and false alarm occurrences. This paper provides a Markovian analysis of BIT accuracy. The results of the analysis are used to develop tradeoff techniques for achieving optimal BIT accuracy levels. (Author)

A82-42216 **R & M characteristics of a Microwave Landing System.** W. R. Belcher (Amalgamated Wireless (Australasia), Ltd., North Ryde, New South Wales, Australia) and R. E. Kuehn (Kuehn and Co., North Ryde, New South Wales, Australia). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 404-407. 10 refs.

The function, performance and hardware implementation of the Time Reference Scanning Beam (TRSB) Interscan Microwave Landing System (MLS) are briefly discussed. Reliability and Maintainability (R and M) design goals for MLS are established. Selected aspects of R and M design support to monitor and optimize implementation are discussed, and the R and M status of an Interscan prototype system assessed. (Author)

A82-42217 **Computer Monitored Inspection Program /CMIP/, a key to increased aircraft and personnel productivity.** H. D. Hall (Lockheed-Georgia Co., Marietta, GA). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 408-416.

A computer program has been developed which permits maintenance managers to maintain aircraft scheduled inspection programs in a dynamic and cost-effective configuration. This program, which is called CMIP (Computer Monitored Inspection Program), was specifically designed to increase the aircraft's and the maintenance manager's productivity by assisting the maintenance manager in evaluating the effectiveness of scheduled maintenance programs. The CMIP gives the maintenance manager the ability to keep inspection programs dynamic and cost-effective while simultaneously maintaining inherent design levels of safety and reliability. (Author)

A82-42229 **F/A-18 Hornet reliability challenge - Status report.** M. P. Ricketts (McDonnell Aircraft Co., St. Louis, MO). In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 491-496.

A development status report is given for the F/A-18 Hornet Reliability Program, in which an attempt is made to give reliability criteria the same design emphasis as weight, performance and cost. Among the established reliability assurance techniques applied are periodic status assessments for each subsystem manager, failure mode and affects analyses, an approved parts list, selective use of Sneak Circuit Analysis, and a closed loop evaluation and reporting system which reports and tracks all equipment failures. The F/A-18's 3.7-hour mean flight time between failures (MFTBF) requirement was tested in 50 Reliability Demonstration flights, and an 8.4-hour MFTBF was demonstrated. The F/A-18 incorporates such high inherent reliability design components as solid state avionics, improved avionics cooling, a fixed-geometry engine air inlet, simpler hydraulics, and the highly simplified F404 engine. O.C.

A82-42462 † **Mathematical models of rotor strength and optimization in computer-aided design (Matematicheskie modeli prochnosti i optimizatsii rotorov pri avtomatizirovannom proektirovanii).** I. V. Dem'ianushko, V. V.

range of 0.6 to 0.95 and at Reynolds numbers 4 million to 6 million. Results show the superiority of supercritical airfoil design. This is explained, referring to overall aerodynamic coefficients, limits of efficiency, and in special cases to pressure distributions. Author (ESA)

N82-30297*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AIRCRAFT ICING RESEARCH AT NASA
J. J. Reinmann, R. J. Shaw, and W. A. Olsen, Jr. 1982 17 p refs Presented at the 1st Intern. Workshop on Atmospheric Icing of Struct., Hanover, N.H., 1-3 Jun. 1982
(NASA-TM-82919; E-1307; NAS 1.15:82919) Avail: NTIS HC A02/MF A01 CSCL 01C

Research activity is described for: ice protection systems, icing instrumentation, experimental methods, analytical modeling for the above, and in flight research. The renewed interest in aircraft icing has come about because of the new need for All-Weather Helicopters and General Aviation aircraft. Because of increased fuel costs, tomorrow's Commercial Transport aircraft will also require new types of ice protection systems and better estimates of the aeropenalties caused by ice on unprotected surfaces. The physics of aircraft icing is very similar to the icing that occurs on ground structures and structures at sea; all involve droplets that freeze on the surfaces because of the cold air. Therefore all icing research groups will benefit greatly by sharing their research information. Author

N82-30298*# Dayton Univ., Ohio. Research Inst.
AERODYNAMIC PENALTIES OF HEAVY RAIN ON A LANDING AIRCRAFT Final Report
Patrick A. Haines and James K. Luers Jul. 1982 72 p refs
(Grant NsG-6026)
(NASA-CR-156885; NAS 1.26:156885; UDR-TR-82-26) Avail: NTIS HC A04/MF A01 CSCL 01C

The aerodynamic penalties of very heavy rain on landing aircraft were investigated. Based on severity and frequency of occurrence, the rainfall rates of 100 mm/hr, 500 mm/hr, and 2000 mm/hr were designated, respectively, as heavy, severe, and incredible. The overall and local collection efficiencies of an aircraft encountering these rains were calculated. The analysis was based on raindrop trajectories in potential flow about an aircraft. All raindrops impinging on the aircraft are assumed to take on its speed. The momentum loss from the rain impact was later used in a landing simulation program. The local collection efficiency was used in estimating the aerodynamic roughness of an aircraft in heavy rain. The drag increase from this roughness was calculated. A number of landing simulations under a fixed stick assumption were done. Serious landing shortfalls were found for either momentum or drag penalties and especially large shortfalls for the combination of both. The latter shortfalls are comparable to those found for severe wind shear conditions. Author

N82-30299# Royal Aircraft Establishment, Farnborough (England). Radio and Navigation Dept.
FLIGHT TRIALS OF THE LITTON LTN-211 OMEGA NAVIGATION SYSTEM IN A WESSEX HELICOPTER
I. D. Birch Jan. 1981 20 p refs
(RAE-TM-RAD-NAV-147; BR78250) Avail: NTIS HC A02/MF A01

The Litton LTN-211 Omega Navigation System is currently in service in RAF transport and other aircraft. Installation and flight trials of the Omega equipment in a Wessex helicopter are described. Author

N82-30303*# National Aeronautics and Space Administration, Washington, D. C.
GROB AIRCRAFT CONSTRUCTION: THE G 110 FLIES
B. Malzbender Jun. 1982 15 p Transl. into ENGLISH from Aerokurier (West Germany), no. 3, 1982 p 262-264 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76893; NAS 1.15:76893) Avail: NTIS HC A02/MF A01 CSCL 01C

Description, specifications and test flight performance of the G 110 are provided. The G 110 completely incorporates modern GfK construction techniques which heretofore have been developed and perfected for the construction of sailplanes. The G 110 is a prototype of a GfK constructed motorized aircraft and shows much promise for the future of German aviation. Author

N82-30304# School of Aerospace Medicine, Brooks AFB, Tex.
HUMAN-FACTORS EVALUATION OF C-141 FUEL SAVINGS ADVISORY SYSTEM Final Report, Dec. 1979 - Feb. 1981
Layne P. Perelli Dec. 1981 33 p refs
(AF Proj. 7930)
(AD-A114931; SAM-TR-81-37) Avail: NTIS HC A03/MF A01 CSCL 01/3

The Air Force installed a Fuel Savings Advisory System (FSAS) in three C-141 aircraft and performed an operational test and evaluation. At the request of the USAF Airlift Center, observers from the USAF School of Aerospace Medicine evaluated human-engineering, workload, and fatigue aspects of FSAS during three long-duration missions. Pilot's subjective fatigue/workload reports, interviews with crewman, and human-engineering analyses indicated that the FSAS was satisfactory for use in MAC airlift operations. Human-engineering solutions are provided, also suggestions for future improvement of the FSAS. Author (GRA)

N82-30305# Naval Air Engineering Center, Lakehurst, N.J. Advanced Technology Office.
APPLICATION OF WEAR DEBRIS ANALYSIS TO AIRCRAFT HYDRAULIC SYSTEMS
P. V. Ciekurs and S. A. Roper (Rockwell International Corp., Columbus, Ohio) 10 May 1982 23 p refs
(WF41461000)
(AD-A115060; NAEC-92-158) Avail: NTIS HC A02/MF A01 CSCL 13/7

This report documents an investigation into the feasibility of applying wear debris analysis methods as a maintenance tool for aircraft hydraulic systems. A breadboard was designed and operated, fluid samples were analyzed and trended. No relevent failures were experienced and limited conclusions reached. Recommendations are made for further investigations. Author (GRA)

N82-30306# Honeywell, Inc., Minneapolis, Minn. Avionics Div.
ASSESSMENT OF STEREOGRAPHICS FOR FIRE CONTROL AND NAVIGATION IN FIGHTER AIRCRAFT Final Report, 1 Aug. 1980 - 30 Nov. 1981
Jeffrey M. Setterholm, S. Joy Mountford, and Paul N. Turner Wright-Patterson AFB, Ohio AFWAL Mar. 1982 95 p
(Contract F33615-80-C-3602; AF Proj. 2403)
(AD-A115414; AVD-TAS-3D-81-DO2; AFWAL-TR-82-3008) Avail: NTIS HC A05/MF A01 CSCL 14/5

Integration of dual helmet-mounted displays, a helmet-attitude tracking device, a six-degree of freedom fighter aircraft digital simulation and dynamic stereo-pair computer graphics line drawings permitted overlaying 3-D (stereo) information on a pilot's view of the world. Display content for weapon delivery and 4-D navigation was investigated. A second display medium using a forward projection, TV, and PLZT goggles was incorporated to aid in the training process. This report documents what was learned in developing and evaluating the displays. Author (GRA)

N82-30307# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
DESIGN AND IMPLEMENTATION OF USAF AVIONICS INTEGRATION SUPPORT FACILITIES M.S. Thesis
Jon G. Hanson Dec. 1981 337 p refs
(AD-A115537; AFIT/GCS/EE/81D-10) Avail: NTIS HC A15/MF A01 CSCL 01/3

The design and implementation of avionic software support facilities known as Avionic Integration Support Facilities (AISFs) are investigated. A complete set of AISF functional requirements is presented in Data Flow Diagram format. This method of presentation facilitated the hierarchical development of the functional requirements. From these functional requirements an implementation model for such a facility is developed. The modeling vehicle used is Softech's Structured Analysis and Design Technique (SADT). The SADT model depicts inputs, outputs, processes, controls, and the mechanisms required to implement the AISF. Author (GRA)

N82-30308# Naval Postgraduate School, Monterey, Calif.
A PRELIMINARY ANALYSIS OF TF34-100/400 JET ENGINE

REWORK DATA IN SUPPORT OF THE MRP SYSTEM IMPLEMENTATION AT NARF ALAMEDA M.S. Thesis
Ernest R. Slaybaugh Dec. 1981 83 p refs
(AD-A114452) Avail: NTIS HC A05/MF A01 CSCL 15/5

The Naval Air Rework Facility (NARF) located at Naval Air Station (NAS) Alameda is in the process of implementing a Material Requirements Planning (MRP) system which will incorporate an inventory model to help manage those repair parts which are not always replaced during component rework. This thesis focused on analyzing TF34-100/400 jet engine rework data as one phase of that implementation. In particular, probability of replacement values were generated for the repair parts from demand data and the rework schedule during 1980, and the engine's bill of materials. In addition, a parametric analysis was conducted to study the optimal relationship between the shortage and surplus costs of the proposed inventory model for the TF34 repair parts. The analyses highlighted the importance of determining the actual shortage costs resulting from a work stoppage and suggested some potentially useful forms for the surplus cost parameter. Author (GRA)

N82-30310# Lincoln Lab., Mass. Inst. of Tech., Lexington.
REMOTE SENSING OF TURBINE ENGINE GASES Final Report, 1 Oct. 1980 - 30 Sep. 1981
Dennis K. Killinger, Norman Menyuk, and Aram Mooradian 30 Sep. 1981 81 p refs
(Contract F19628-80-C-0002; AF Proj. 1900)
(AD-A115443; ESD-TR-82-014; AFESC/ESL-TR-82-016)
Avail: NTIS HC A05/MF A01 CSCL 20/5

This is the FY 81 final report on the program entitled 'Remote Sensing of Turbine Engine Gases'. The specific tasks which were conducted during FY 81 consisted of the following: (1) the feasibility demonstration of a dual-laser differential-absorption LIDAR(DIAL) system for the remote sensing of CO, NO, and C2H4, (2) the development of a data acquisition and processing system for the dual-laser DIAL system, (3) the laser remote sensing of CO and C2H4 in the exhaust of a stationary jet aircraft, and (4) the laser remote sensing of hydrazine, monomethylhydrazine (MMH), and unsymmetrical dimethylhydrazine (UDMH). GRA

N82-30312# Naval Postgraduate School, Monterey, Calif. Dept. of Aeronautics.
THE LATERAL RESPONSE OF AN AIRSHIP TO TURBULENCE M.S. Thesis
John J. Wrobleski, Jr. Dec. 1981 151 p refs
(AD-A115197) Avail: NTIS HC A08/MF A01 CSCL 20/4

A method is derived for finding the linear response and loading transfer functions for the lateral aerodynamic case of airship flight through atmospheric turbulence. The functions obtained are in a form that can be applied to the various spectral analysis methods used to predict survivability currently employed by designers. A numerical example using the USS AKRON (ZR-4) is presented. The results show that peak motion response and loading occur when the encountered spectral component has a wavelength equal to the airship length, and that simple feedback of heading angle does not significantly decrease this peak. Author (GRA)

N82-30313# Hochschule der Bundeswehr, Munich. (West Germany). Fachbereich Luft-und Raumfahrttechnik.
OPTIMAL PERIODIC DOLPHIN GLIDING FLIGHT [OPTIMALER PERIODISCHER DELPHIN-SEGELFLUG]
E. D. Dickmanns Feb. 1982 48 p refs In GERMAN
Avail: NTIS HC A03/MF A01

Numerically calculated time optimal flight paths through vertical wind fields are discussed for different wind field types and airplane classes. For solution types 1 (prefers speed to altitude, globally optimal for small wind fields), the ratio of path oscillation wavelength to up-wind field wavelength was chosen as criterion for global optimization. The most favorable control sequence as well as the most favorable periodic boundary values for the speed components are determined. Calculations on examples for three wind field families and three airplane types with the best reciprocal glide numbers 29, 41, and 55, show that the unstationary type 2 the for aerodynamically highly sophisticated airplanes with large wing load (water ballast) are more meaningful than for conventional gliders with small wing load. Author (ESA)

N82-30314*# Southampton Univ. (England). Dept. of Aeronautics and Astronautics.
CONTROL SOFTWARE FOR TWO DIMENSIONAL AIRFOIL TESTS USING A SELF-STREAMLINING FLEXIBLE WALLED TRANSONIC TEST SECTION Semiannual Progress Report for period ending Feb. 1982
S. W. D Wolf and M. J. Goodyer Jul. 1982 90 p refs
(Grant NsG-7172)
(NASA-CR-165941; NAS 1.26:165941) Avail: NTIS HC A05/MF A01 CSCL 14B

Operation of the Transonic Self-Streamlining Wind Tunnel (TSWT) involved on-line data acquisition with automatic wall adjustment. A tunnel run consisted of streamlining the walls from known starting contours in iterative steps and acquiring model data. Each run performs what is described as a streamlining cycle. The associated software is presented. Author

N82-30315# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
ANALYSIS AND PREPARATION OF A DIGITAL TERRAIN DATA BASE FOR FLIGHT SIMULATOR USE M.S. Thesis
Harry D. Ross Nov. 1981 68 p refs
(AD-A115547; AFIT/GEO/MA-81D-1) Avail: NTIS HC A04/MF A01 CSCL 06/6

The Air Force needs low-level, high speed flight simulators capable of producing correlated visual, radar, and infra-red display scenes. These scenes can be produced by computer generated imagery if a suitable data base is available. The purpose of this thesis is to develop a digital terrain data base suitable for use in a high speed, low-level flight simulator. A 164,000 square nautical mile data base was constructed from data supplied by the Defense Mapping Agency. This paper discussed the construction and organization of the data base, as well as the data retrieval algorithms. It was demonstrated that the data could be accessed fast enough to simulate Mach 1 flight. Author (GRA)

N82-30336*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH TEMPERATURE COMPOSITES. STATUS AND FUTURE DIRECTIONS
Robert A. Signorelli 1982 25 p refs Presented at the 4th Intern. Conf. on Composite Mater., Tokyo, 25-28 Oct. 1982
(NASA-TM-82929; E-1280; NAS 1.15:82929) Avail: NTIS HC A02/MF A01 CSCL 11D

A summary of research investigations of manufacturing methods, fabrication methods, and testing of high temperature composites for use in gas turbine engines is presented. Ceramic/ceramic, ceramic/metal, and metal/metal composites are considered. Directional solidification of superalloys and eutectic alloys, fiber reinforced metal and ceramic composites, ceramic fibers and whiskers, refractory coatings, metal fiber/metal composites, matrix metal selection, and the preparation of test specimens are discussed. J.D.

N82-30337*# National Aeronautics and Space Administration, Washington, D. C.
COMPOSITE MATERIALS: TOMORROW FOR THE DAY AFTER TOMORROW
Pierre Condom May 1982 21 p Transl. into ENGLISH from Aviation Mag. Intern. (France), no. 817, 1-14 Jan. 1982 p 34-39 Transl. by SCITRAN, Santa Barbara, Calif.
(Contract NASw-3542)
(NASA-TM-76709; NAS 1.15:76709) Avail: NTIS HC A02/MF A01 CSCL 11D

A description is given of the history of the use of composite materials in the aerospace industry. Research programs underway to obtain exact data on the behavior of composite materials over time are discussed. It is concluded that metal composites have not yet replaced metals, but that that this may be a future possibility. Author

N82-30340# Atlantic Research Corp., Alexandria, Va.
NOTEBOOK ON ELECTROMAGNETIC PROPERTIES OF COMPOSITE MATERIALS BELOW 1 GHz Final Technical Report
D. R. Pflug, J. A. Birken, R. A. Wallenberg, and D. T. Auckland Sep. 1981 154 p refs
(Contract N00019-80-C-0157)
(AD-A115132; NAVAIR-AIR-518-9) Avail: NTIS HC A08/MF A01 CSCL 11/4

This report is the seventh in a series of reports on the electromagnetic properties of composites materials. The report

Avail: NTIS HC A03/MF A01

Research in fluid dynamics, acoustics, automotive engineering, audiology, noise and vibration effects (on human beings), and structural response to noise and vibration was carried out. Aircraft noise, acoustics of flow duct systems and enclosures, acoustic modeling, sound propagation, and acoustic measurement techniques were studied. Auditory and vestibular functions and electrophysiology were investigated. Author (ESA)

N82-31637*# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.

REAL TIME ESTIMATION AND PREDICTION OF SHIP MOTIONS USING KALMAN FILTERING TECHNIQUES

Michael A. Triantafyllou, Marc Bodson, and Michael Athans Jul. 1982 142 p refs

(Grant NGL-22-009-124)

(NASA-CR-169284; NAS 1.26:169284; LIDS-R-1220) Avail: NTIS HC A07/MF A01 CSCL 20D

A landing scheme for landing V/STOL aircraft on rolling ships was sought using computerized simulations. The equations of motion as derived from hydrodynamics, their form and the physical mechanisms involved and the general form of the approximation are discussed. The modeling of the sea is discussed. The derivation of the state-space equations for the DD-963 destroyer is described. Kalman filter studies are presented and the influence of the various parameters is assessed. The effect of various modeling parameters on the rms error is assessed and simplifying conclusions are drawn. An upper bound for prediction time of about five seconds is established, with the exception of roll, which can be predicted up to ten seconds ahead. R.J.F.

N82-31639*# City Coll. Research Foundation, New York. Turbomachinery Lab.

EXPERIMENTAL STUDY OF TURBULENCE IN BLADE END WALL CORNER REGION

R. Raj Aug. 1982 110 p refs

(Grant NAG3-122)

(NASA-CR-169283; NAS 1.26:169283; RF-05438) Avail: NTIS HC A06/MF A01 CSCL 20D

Corner flows and wall pressure fluctuations, design and fabrication of the test model, preliminary results on boundary layer, flow visualization, turbulence intensity and spectra measurements are presented. The design consideration and fabrication report on the newly built wind tunnel to be used for subsequent continuation of the research effort is also presented. S.L.

N82-31645*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LAMINAR FLOW CONTROL, 1976 - 1982: A SELECTED ANNOTATED BIBLIOGRAPHY

Marie H. Tuttle and Dal V. Maddalon Aug. 1982 82 p

(NASA-TM-84496; L-15434; NAS 1.15:84496) Avail: NTIS HC A05/MF A01 CSCL 20D

Laminar Flow Control technology development has undergone tremendous progress in recent years as focused research efforts in materials, aerodynamics, systems, and structures have begun to pay off. A virtual explosion in the number of research papers published on this subject has occurred since interest was first stimulated by the 1976 introduction of NASA's Aircraft Energy Efficiency Laminar Flow Control Program. The purpose of this selected bibliography is to list available, unclassified laminar flow (both controlled and natural) research completed from about 1975 to mid 1982. Some earlier pertinent reports are included but listed separately in the Appendix. Reports listed herein emphasize aerodynamics and systems studies, but some structures work is also summarized. Aerodynamic work is mainly limited to the subsonic and transonic sped regimes. Because wind-tunnel flow qualities, such as free stream disturbance level, play such an important role in boundary-layer transition, much recent research has been done in this area and it is also included. Author

N82-31663*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DEVELOPMENT AND UTILIZATION OF A LASER VELOCIMETER SYSTEM FOR A LARGE TRANSONIC WIND TUNNEL

Robert J. Freedman and John P. Greissing Jun. 1982 17 p refs

(NASA-TM-82886; E-1264; NAS 1.15:82886) Avail: NTIS HC A02/MF A01 CSCL 14B

The need for measurements of the velocity flow field about spinner propeller nacelle configurations at Mach numbers to 0.8 was met by a specially developed laser velocimeter system. This system, which uses an argon ion laser and 4 beam 2 color optics, was required to operate in the hostile environment associated with the operation of a large transonic wind tunnel. To overcome the conditions present in locating the sensitive optics in close proximity to the wind tunnel, an isolation system was developed. The system protects the velocimeter from the high vibrations, elevated temperatures, destructive acoustic pressures and low atmospheric pressures attendant with the operation of the wind tunnel. The system was utilized to map the flow field in front of, behind and in between the rotating blades of an advanced swept blade propeller model at a Mach number of 0.8. The data collected by the system will be used to correlate and verify computer analyses of propeller nacelle flow fields and propeller performance. R.J.F.

N82-31694# AiResearch Mfg. Co., Torrance, Calif.

ELECTROMECHANICAL ACTUATION DEVELOPMENT PROGRAM (EADP). POWER CONTROL DEVELOPMENT Final Report, Jul. 1980 -Sep. 1981

Stephen Rowe, David Bailey, and Robert Belanus Wright-Patterson AFB, Ohio AFWAL Sep. 1981 146 p

(Contract F33615-80-C-3620; AF Proj. 2403)

(AD-A116126; AMC-81-18106; AFWAL-TR-81-3106) Avail: NTIS HC A07/MF A01 CSCL 20/3

Electromechanical actuation of primary flight control surfaces has been demonstrated by the development of an integrated rotary hingeline dual-redundant actuation unit. Improved system bandwidth was demonstrated after employing improved sensors and electronic controls. Author (GRA)

N82-31705 Politecnico di Milano (Italy). Dept. di Ingegneria Aerospaziale.

EXPERIMENTAL INVESTIGATION OF AEROELASTIC INSTABILITY OF OPEN FIELD THIN PROFILES [INDAGINE SPERIMENTALE SUL'INSTABILITA AEROELASTICA DI PROFILI SOTTILI APERTI]

G. Casarico (Soc. Anonima Elettrificazione SPA), S. DePonte, and P. Faggiano (Soc. Anonima Elettrificazione SPA) 1981 11 p In ITALIAN Presented at Coll. dei Tec. dell'Acciaio (CTA) Giornate Ital. della Costruzione in Acciaio, Palerma, Italy, Oct. 1981

Avail: Issuing Activity

The behavior of thin wall metal profiles under oscillating aerodynamic loads was investigated in a wind tunnel. The beams were held by elastic constraint, being able to move in all directions, while the air incidence angle was varied throughout the experiments. Three types of transient response characterized by one or two critical wind velocities and either flexional or torsional vibration, which are related to the profile characteristics and the wind incidence, are described. Author (ESA)

N82-31707*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LARGE DISPLACEMENTS AND STABILITY ANALYSIS OF NONLINEAR PROPELLER STRUCTURES

Robert A. Aiello 1982 18 p refs Presented at the 10th NASTRAN User's Colloq., New Orleans, 13-14 May 1982

(NASA-TM-82850; NAS 1.15:82850) Avail: NTIS HC A02/MF A01 CSCL 20K

The use of linear rigid formats in COSMIC NASTRAN without DMAP procedures for the analysis of nonlinear propeller structures is described. Approaches for updating geometry and applying follower forces for incremental loading are demonstrated. Comparisons are made with COSMIC NASTRAN rigid formats and other independent finite element programs. Specifically, the comparisons include results from the four approaches for updating the geometry using RIGID FORMAT 1, RIGID FORMATS 4 and 13, MARC and MSC/NASTRAN. It is shown that 'user friendly' updating approaches (without DMAPS) can be used to predict the large displacements and instability of these nonlinear structures. These user friendly approaches can be easily implemented by the user and predict conservative results. Author

N82-31714# Army Armament Research and Development Command, Watervliet, N. Y. Large Caliber Weapon Systems Lab.
STRESS INTENSITY FACTORS FOR RADIAL CRACKS AT OUTER SURFACE OF A PARTIALLY AUTOFRETTAGED CYLINDER SUBJECTED TO INTERNAL PRESSURE Final Report
S. L. Pu May 1982 50 p refs
(DA Proj. 1L1-61102-AH-60)
(AD-A116396; ARLCB-TR-82003) Avail: NTIS HC A03/MF A01 CSCL 12/1

The functional stress intensity factor approach which combines the finite element, thermal simulation and weight function methods developed for the computation of stress intensity factors for multiple radial cracks at the inner surface of a partially autofrettaged cylinder is applied in this report to external cracks. Numerical results of stress intensity factors are obtained for a cylinder with outer diameter twice the inner diameter. A slight increase into the degree of autofrettage will increase stress intensity factors of inner cracks slightly but will decrease stress intensity factors of external cracks considerably. As in the inner crack case, the cylinder with two diametrically opposed external cracks is in general the weakest configuration and for more than two cracks, the stress intensity factor decreases as the number of external cracks increase. Author (GRA)

N82-31718# Riso National Lab., Roskilde (Denmark).
AERODYNAMIC FORCES ACTING ON THE BLADES OF STALL REGULATED PROPELLER TYPE WINDMILLS
F. Rasmussen Aug. 1981 37 p refs In DANISH
(DE82-901178; RISO-M-2316) Avail: NTIS (US Sales Only) HC A03/MF A01; DOE Depository Libraries; also available from Risoe Library, DK-4000, Roskilde, Denmark

Aerodynamic forces acting on the blades of stall regulated propeller type windmills are discussed. The expected dynamic behavior of the loads are outlined. Great dynamic loads under stall condition and skew wind (yaw or tilt) are shown by theoretical calculations from the blade element theory for one typical design. The forces on the three blades are calculated as well as the total forces from the rotor acting on the main shaft. Blade strut forces on a 10 m diameter, three blades Riisager windmill are measured. DOE

N82-31965*# Sikorsky Aircraft, Stratford, Conn.
COUPLED ROTOR/AIRFRAME VIBRATION ANALYSIS PROGRAM MANUAL MANUAL. VOLUME 1: USER'S AND PROGRAMMER'S INSTRUCTIONS Final Report
S. Cassarino and R. Sopher Jun. 1982 212 p refs Sponsored in part by ARMY 2 Vol.
(Contract NAS1-16058)
(NASA-CR-165891; NAS 1.26:165891) Avail: NTIS HC A10/MF A01 CSCL 09B

user instruction and software descriptions for the base program of the coupled rotor/airframe vibration analysis are provided. The functional capabilities and procedures for running the program are provided. Interfaces with external programs are discussed. The procedure of synthesizing a dynamic system and the various solution methods are described. Input data and output results are presented. Detailed information is provided on the program structure. Sample test case results for five representative dynamic configurations are provided and discussed. System response are plotted to demonstrate the plots capabilities available. Instructions to install and execute SIMVIB on the CDC computer system are provided. Author

N82-31966*# Sikorsky Aircraft, Stratford, Conn.
COUPLED ROTOR/AIRFRAME VIBRATION ANALYSIS PROGRAM MANUAL. VOLUME 2: SAMPLE INPUT AND OUTPUT LISTINGS Final Report
S. Cassarino and R. Sopher Jun. 1982 263 p refs Sponsored in part by ARMY 2 Vol.
(Contract NAS1-16058)
(NASA-CR-165892; NAS 1.26:165892) Avail: NTIS HC A12/MF A01 CSCL 09B

Sample input and output listings obtained with the base program (SIMVIB) of the coupled rotor/airframe vibration analysis and the external programs, G400/F389 and E927 are presented. Results for five of the base program test cases are shown. They represent different applications of the SIMVIB program to study the vibration characteristics of various dynamic configurations. Input and output listings obtained for one cycle of the G400/F389 coupled program are presented. Results from the rotor aeroelastic analysis E927 also appear. A brief description of the check cases is provided. A summary of the check cases for all the external programs interacting with the SIMVIB program is illustrated. Author

N82-31967*# Illinois Univ., Urbana-Champaign. Coordinated Science Lab.
MULTILEVEL SEMANTIC ANALYSIS AND PROBLEM-SOLVING IN THE FLIGHT DOMAIN Final Report, 11 Jul. 1981 - 10 Jul. 1982
R. T. Chien, D. C. Chen, W. P.-C. Ho, and Y. C. Pan Aug. 1982 111 p refs
(Contract NCC1-52)
(NASA-CR-169282; NAS 1.26:169282; T-117) Avail: NTIS HC A06/MF A01 CSCL 09B

A computer based cockpit system which is capable of assisting the pilot in such important tasks as monitoring, diagnosis, and trend analysis was developed. The system is properly organized and is endowed with a knowledge base so that it enhances the pilot's control over the aircraft while simultaneously reducing his workload. S.L.

N82-31974# Kaman Aerospace Corp., Bloomfield, Conn.
DYNAMIC SYSTEM COUPLING (DYSCO) PROGRAM. VOLUME 1: USER'S MANUAL Final Technical Report
A. Berman Fort Eustis, Va. Army Research and Technology Labs. Apr. 1982 40 p 2 Vol.
(Contract DAAK51-79-C-0046; DA Proj. 1L1-62209-AH-76)
(AD-A115003; R-1649-Vol-1; USAAVRADCOM-TR-81-D-42A-Vol-1) Avail: NTIS HC A03/MF A01 CSCL 09/2

Dynamic System Coupling (DYSCO) is a computer program which allows an interactive user to couple arbitrary components and force algorithms into a model of a helicopter or other dynamic system. The equations of the system may then be solved by a choice of analytical methods. The components available are rigid blade rotor, elastic fuselage, rotor control system, and other structures representable by general linear second-order differential equations. The force methods available are linear rotor loads, tabular rotor aerodynamics with optional induced velocity map, fuselage flat plate drag, and sinusoidal shaker. The solution methods available are time history, linear constant coefficient eigenanalysis, and complex frequency response. The program has the capability of being expanded in its level of complexity by the addition of other technology modules. Author (GRA)

N82-31975# Kaman Aerospace Corp., Bloomfield, Conn.
DYNAMIC SYSTEM COUPLING (DYSCO) PROGRAM. VOLUME 2: THEORETICAL MANUAL Final Report
A. Berman Fort Eustis, Va. Army Research and Technology Labs. Apr. 1982 84 p 2 Vol.
(Contract DAAK51-79-C-0046; DA Proj. 1L1-62209-AH-76)
(AD-A115004; R-1649-Vol-2; USAAVRADCOM-TR-81-D-42B-Vol-2) Avail: NTIS HC A05/MF A01 CSCL 09/2

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- *Scientific and Technical Aerospace Reports (STAR)*
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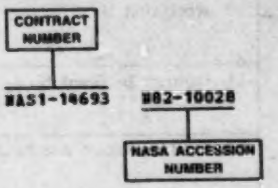

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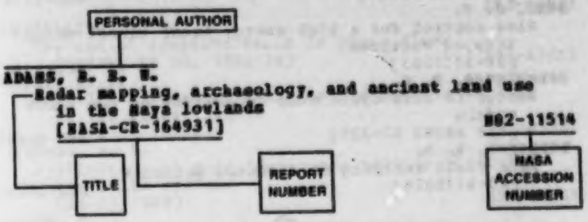

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